FOR OFFICIAL USE ONLY

Vol. 13. No. 9. pp. 309-346. September, 1943

THE VETERINARY BULLETIN

1943

IMPERIAL MYCOLOGICAL INSTITUTE
2 SEPT 1943

IMPERIAL BUREAU OF ANIMAL HEALTH
WEYBRIDGE, SURREY
ENGLAND

Price 5/- net

Annual Subscription £2

Imperial Agricultural Bureaux.

EXECUTIVE COUNCIL

SHAMALDHARI LALL, C.I.E., I.C.S., Officiating High Commissioner, *Chairman*	India and Burma.
G. H. CREASY, C.M.G., O.B.E.	Colonies, Protectorates and Mandated Territories.
Sir DONALD FERGUSSON, K.C.B.	United Kingdom.
Lt.-Col. J. G. ROBERTSON	Canada.
F. L. McDOUGALL, C.M.G.	Australia.
F. J. DU TOIT	Union of S. Africa.
A. L. POOLE (*Acting*)	New Zealand.
J. M. ADAMS, F.R.C.Sc.(I)	Eire.
D. JAMES DAVIES, C.B.E.	Newfoundland.
W. C. ROBERTSON	Southern Rhodesia.
Sir DAVID CHADWICK, K.C.M.G., C.S.I., C.I.E.	Secretary.

STAFF OF IMPERIAL BUREAU OF ANIMAL HEALTH, WEYBRIDGE

Director :

Professor T. DALLING, M.A., M.R.C.V.S.

Deputy Director and Editor of The Veterinary Bulletin and of Index Veterinarius :

W. A. POOL, M.R.C.V.S.

Second Officer :

J. TWEEDALE EDWARDS, M.R.C.V.S.

Scientific Assistants :

RUTH ALLCROFT, B.Sc., PH.D.

ENID M. SMEDLEY, M.Sc.

Technical Assistants :

G. EIRA JONES, B.A.

MOYA RIMINTON.

CONTENTS

[Most subjects are referred to below. Readers are recommended, however, to look through all the abstracts for items of more restricted interest. Information on many diseases may be found in various sections, such as Immunity, Therapeutics, etc. See also key to the arrangement of abstracts given in the January, 1943 issue.]

DISEASES CAUSED BY BACTERIA AND FUNGI, 309-316.

Streptococci, 309; Mastitis, 309; Tuberculosis, 309; Johne's disease, 312; Listerella infection, 312; Haemophilus influenzae, 313; Brucellosis, 313; Anaerobic infections, 313; Fungous infections, 314; Rat bite fever, 315.

DISEASES CAUSED BY PROTOZOAN PARASITES, 316-317.

Trypanosomiasis, 316; Coccidiosis, 316; Avian malaria, 317.

DISEASES CAUSED BY VIRUSES AND RICKETTSIA, 317-321.

Foot and mouth disease, 317; Rabies, 318; Influenza, 318; Equine encephalomyelitis, 319; Porcine encephalomyelitis, 320; Distemper in minks, 320.

IMMUNITY, 321.

PARASITES IN RELATION TO DISEASE [GENERAL], 321-322.

PARASITES IN RELATION TO DISEASE [ARTHROPODS], 322.

PARASITES IN RELATION TO DISEASE [HELMINTHS], 322-325.

Trematodes, 322; Cysticercosis, 323; Nematodes, 323.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS], 325-327.

DISEASES, GENERAL, 327-329.

Diseases of poultry, 327; Colic in horses, 328.

NUTRITIONAL AND METABOLIC DISORDERS, 329-333.

General nutrition, 329; Proteins and amino acids, 330; Goiterogenic action of the diet, 330; Minerals, 330; Vitamins general, 331; Vitamins A, B_1, B_2, 331; —— B_2 complex, C, 332; Magnesium in thyroid disease, 333.

PHYSIOLOGY AND ANATOMY, 333-336.

General physiology, 333; —— of metabolism and circulation, 333-334; Reproduction, 334; Mechanism of lactation, 335; Hormones, 336; Anatomy, 334, 336.

POISONS AND POISONING, 337-338.

Inorganic, 337; Cacao products, 337.

THERAPEUTICS AND DISINFECTION, 338-341.

Antibacterial substances, penicillin, tyrothricin, sulphonamides, 338-339; Foot and mouth disease, 340; Insecticides, 340; Anthelmintics, 340; Treatment of unclassified diseases, 341.

HYGIENE AND PUBLIC HEALTH, 341-342.

Milk borne diseases, 341; Meat hygiene, 342.

TECHNIQUE AND APPARATUS, 343-344.

Bacteriological, 343; Haematological, 343; Various, 344.

MISCELLANEOUS, 344-345.

REPORT, 345-346.

Eire, 345.

BOOK REVIEWS, 346.

Abramowitz, R. K. See Loofbourow, J. R., et al., jt. authors, 329.
Ackernecht, E., 336, *bis*.
Albanese, A. A., Randall, R. McI., & Holt, L. E., 330.
Anantaraman, M., 323.
Anderson, O. A., 344.
Andrews, J. S., Morales Otero, P., & Maldonado, J. F., 328.
Anthony, E. K. See Sharpless, G. R., et al., jt. authors, 330.
Antopol, W., & Unna, K., 331.
Aoki, Y., & Kanemitsu, J., 321.
Argetsinger, H. L. See Sharpless, G. R., et al., jt. authors, 330.
Asakawa, S., 310.
Atkeson, F. W., Shaw, A. O., Smith, R. C., & Borgmann, A. R., 342.

Babcock, C. J. See Haller, H. S., et al., jt. authors, 342.
Baker, D. W., 322.
Bakker, T., 327.
Ball, H. A., 326.
Barboni, E., 312.
Barke, A., 341.
Barron, N. S. See Black, D. J. G., jt. author, 337.
Basu, P. N., & Sen, S. N., 314.
Beck, M. D., & Eaton, M. D., 321.
Bendixen, H. C. See Larsen, L. H., jt. author, 318.
Bergmann, F., 326.
Bethke, R. M. See Hunt, C. H., et al., jt authors, 331.
Bevan, H. G. L. See Rose, F. L., et al., jt. authors, 339.
Bischoff, F., & Ingraham, L. P., 336.
Bishop, A., 317.
Black, D. J. G., & Barron, N. S., 337.
Blakemore, F., & Shearer, G. D., 337.
Boecker, E., & Jahn, G., 318.
Borgmann, A. R. See Atkeson, F. W., et al., jt. authors, 342.
Bortolotti, M., 318.
Bradbury, F. R., & Jordan, D. O., 338.
Breidenbach, L. See Lewis, K. M., et al., jt. authors, 344.
Briggs, G. M., Jr., Luckey, T. D., Mills, R. C., Elvehjem, C. A., & Hart, E. B., 332.
Briggs, H. M., 329.
Brouwers, J., 333.
Brown, T. M., & Nunemaker, J. C., 315.
Bryan, A. H., 338.
Bryan, C. S., Weldy, M. L., & Greenberg, J., 338.
Buer, A. W., 316.
Burkholder, P. R., & McVeigh, I., 316.
Burroughs, E. W. See Hunt, C. H., et al., jt. authors, 331.
Byers, H. G., Miller, J. T., Williams, K. T., & Lakin, H. W., 337.

Cabasso, V., 311.
Callaway, C. P. See Russell, W. O., jt. author, 332.
Callow, H. J. See Thompson, J. H., et al., jt. authors, 326.
Calvery, H. O. See Nelson, A. A., et al., jt. authors, 326.
Camm, G. L. See Harper, A. A., et al., jt. authors, 331.
de Candole, C. A., 339.
Capotosti, A., 343, *bis*.
Carlström, B., 320.
Carr, J. G., 327.
Carter, J. R. See Madden, S. C., et al., jt. authors, 330.
Chen, H. T., 323.
Chisstovich, & Girbassova, L. V., 311.
Cicconi, M., 312.
Clapham, B. See Korenchevsky, V., et al., jt. authors, 332.
Clapp, M. P., 338.
Clark, L. T., & Follin, S. F., 311.
Clayton, T. M., 340.
Colarieti, F., 310.
Conroy, E. See Hollon, H., et al., jt. authors, 310.
Cook, E. S., & Cronin, A. G., 329.
Cooperman, J. M., Waisman, H. A., & Elvehjem, C. A., 331.
Cronin, A. G. See Cook, E. S., jt. author, 329.

Dack, G. M., & Hoskins, D., 314.
Deane, D. L., 342.
Demmel, M., 345.
Deubler, M. J. See Martin, H. M., jt. author, 322.
Dinter, Z., 313.
Dische, Z. See Lewisohn, R., et al., jt. authors, 326.
DiSomma, A. A. See Trelease, S. F., et al., jt. authors, 337.
Dive, R. F., & Lavietes, P. H., 333.
Doljanski, L., Hoffman, R. S., & Tenenbaum, E., 329.
—, & Pikovski, M., 327.
—. See also Werner, H., jt. author, 329.
De Dominicis, L., 345.
Douglas, A., 327.
Doyle, T. M. See Matthews, H. T., jt. author, 320.

Eaton, M. D. See Beck, M. D., jt. author, 321.
Eberbeck, 319.
Eggerth, A. H., 321.
Eire. Rep. Minist. Agric., 1941-42, 345.
Elgart, S. See Mirsky, I. A., et al., jt. authors, 330.
Ellis, N. R. See Haller, H. S., et al., jt. authors, 342.
Elvehjem, C. A. See Briggs, G. M., Jr., et al., jt. authors, 332.
—. See also Cooperman, J. M., et al., jt. authors, 331.
Etcheverry, J. C., 311.
Evans, A. C. See Robinson, F. H., jt. author, 342.
Evans, E. A., Jr., 346.
Evranova, V. G., 323.

Faguet, M., 343.
Farrell, M. A. See Thorp, W. T. S., et al., jt. authors, 328.
Feinstone, W. H., 339.
Feller, A. E., Roberts, L. B., Ralli, E. P., & Francis, T., Jr., 331.
Fester, A. See Gawrilow, W., et al., jt. authors, 325.
Fitzhugh, O. G. See Nelson, A. A., et al., jt. authors, 326.
Flückiger, G., 318.
Follin, S. F. See Clark, L. T., jt. author, 311.
Follis, R. H., Jr., 331, 333.
Forbes, J. C., Leach, B. E., & Williams, G. Z., 341.
Fouts, P. J., 332.
Francis, T., Jr., & Magill, T. P., 321.
—. See also Feller, A. E., et al., jt. authors, 331.

Gaedtke, H., 342.
Gallo, P., & Vogelsang, E. G., 319.
Gawrilow, W., Szues, E., & Fester, A., 325.
Gengoux, P., 343.
Gerlaugh, P. See Hunt, C. H., et al., jt. authors, 331.
Gibson, E. B. See Randolph, T. G., jt. author, 343.
Gilder, H. See Hoagland, C. L., et al., jt. authors, 313.
Girbassova, L. V. See Chisstovich, jt. author, 311.
Gisske, W., 343.
Gordon, R. F., 327.
Gould, S. E., 323.
Graffi, A., 326.
Great Britain. Rep. med. Res. Coun. Haemoglobinometry, 343.
Greenberg, J. See Bryan, C. S., et al., jt. authors, 338.
Greenfield, S. S. See Trelease, S. F., et al., jt. authors, 337.
Griffiths, S. D., 313.
Groover, M. E., Jr. See Sheldon, A. J., jt. author, 324.
Gunsalus, I. C. See Wood, A. J., jt. author, 309.
Gutowska, M. S., & Parkhurst, R. T., 330.

Hall, K. See Korenchevsky, V., et al., jt. authors, 332.
Haller, H. S., Babcock, C. J., & Ellis, N. R., 342.
Hammon, W. McD., 320.
Harbitz, F., 325.
Hare, T., 327.
Harms, 313.
Harper, A. A., Mackay, I. F. S., Raper, H. S., & Camm, G. L., 331.
Hart, E. B. See Briggs, G. M., Jr., et al., jt. authors, 332.
Hazlet, S. E. See Wegner, E. E., jt. author, 345.
Heguito, H. R., 324.
Heiseke, E., 319.
Hellbaum, A. A. See Turner, H. H., et al., jt. authors, 336.
Henderson, J. L., 341.
Henle, G., & Zittle, C. A., 334.
Hennaux, L., 341.
Henricson, T., 312.
Heymann, G. See Zimmermann, W., jt. author, 318.
Hirst, G. K., 318.
Hoagland, C. L., Ward, S. M., Gilder, H. & Shank, R. E., 313.
—, —, Smadel, J. E., & Rivers, T. M., 318.
Hofferber, 314.
Hoffman, R. S. See Doljanski, L., et al., jt. authors, 329.
Hogan, A. G., & Johnson, S. R., 329.
Hollon, H., Sprick, M., Conroy, E., & Wilson, E., 310.
Holt, L. E. See Albanese, A. A., et al., jt. authors, 330.
Holt, L. E., Jr. See Najjar, V. A., et al., jt. authors, 332.
Holt, P. F. See Thompson, J. H., et al., jt. authors, 326.
Hopf, L., 309.
Hornby, H. E. See Staples, R. R., et al., jt. authors, 345.
Hornby, R. M. See Staples, R. R., et al., jt. authors, 345.
Hoskins, D. See Dack, G. M., jt. author, 314.
Huang, C. H., 319.
Hübscher, B., 328.
Hughes, E. H., 332.
—, & Ittner, N. R., 332.
Hunt, C. H., Burroughs, E. W., Bethke, R. M., Schalk, A. F., & Gerlaugh, P., 331.
Hupbauer, A., & Žarnić, I., 320, *bis*.
Hutner, S. H. See Zahl, P. L., jt. author, 325.

Ingraham, L. P. See Bischoff, F., jt. author, 336.
Ittner, N. R. See Hughes, E. H., jt. author, 332.
Iwanoff, X., 328.

Jahn, G. See Boecker, E., jt. author, 318.
Jiřina, K., 342.
Johansson, A., 337.
Johnson, S. R., 330.
—. See also Hogan, A. G., jt. author, 329.
Jones, L. R. See Roberts, E. C., jt. author, 320.
Jones, T. C., 344.
Jordan, D. O. See Bradbury, F. R., jt. author, 338.
Jukes, T. H., & Welch, A. D., 332.

Kabat, H. See Racker, E., jt. author, 321.
Kabler, C. V. See Najjar, V. A., et al., jt. authors, 332.
Kahler, H., 344.
Kanemitsu, J. See Aoki, Y., jt. author, 321.
Kapfhammer, J., 333.
Kates, K. C., 324.
Kattus, A. A., Jr. See Madden, S. C., et al., jt. authors, 330.
Killmer, 345.
Kissileff, A., 322.
Kline, B. E., Wasley, W. L., & Rusch, H. P., 326.
Kofoid, C. A., 316.
Kolmodin, P. I., 314.
Korenchevsky, V., Hall, K., & Clapham, B., 332.
Krauss, F., 340.
Kreke, C. W. See Nutini, L. G., jt. author, 309.
Kurang, J. M. See Yegian, D., jt. author, 310.
Kurung, J. See Yegian, D., jt. author, 311.

Lachmann, E. See Turner, H. H., et al., jt. authors, 336.
Lakin, H. W. See Byers, H. G., et al., jt. authors, 337.
Larsen, L. H., & Bendiken, H. C., 318.
Laszlo, D. See Lewisohn, R., et al., jt. authors, 326.
Lavietes, P. H. See Dive, R. F., jt. author, 333.
Leach, B. E. See Forbes, J. C., et al., jt. authors, 341.
LeGalley, D. P., & Patterson, G. W., 341.
Leuchtenberger, C. See Lewisohn, R., et al., jt. authors, 326.
Leuchtenberger, R. See Lewisohn, R., et al., jt. authors, 326.
Levine, M. See Vaughn, R. H., jt. author, 313.
Levine, P. P., 316.
Lewis, E. A., 340.
Lewis, K. M., Breidenbach, L., & Stader, O., 344.
Lewisohn, R., Leuchtenberger, C., Leuchtenberger, R., Laszlo, D., & Dische, Z., 326.
Lichtenstein, M. R., 310.
Longwell, J. H. See Telford, H. S., et al., jt. authors, 340.
Loofbourow, D. G. See Loofbourow, J. R., et al., jt. authors, 329.
Loofbourow, J. R., 329.
—, Webb, A. M., Loofbourow, D. G., & Abramowitz, R. K., 329.
Lovell, R., 312.
Luckey, T. D. See Briggs, G. M., Jr., et al., jt. authors, 332.
Lüth, K. H., 337.

McCallum, J. W. See Stewart, J., jt. author, 331.
Machul'skil, S. N. See Yakimov, V. L., jt. author, 317.
Mackay, F. S. See Harper, A. A., et al., jt. authors, 331.
McKee, C. M., & Rake, G., 338.
McLendon, S. B., 317.
McSpadden, B. J. See Parker, J. E., jt. author, 334.
McVeigh, I. See Burkholder, P. R., jt. author, 316.
Madden, S. C., Carter, J. R., Kattus, A. A., Jr., Miller, L. L., & Whipple, G. H., 330.
Magill, T. P. See Francis, T., Jr., jt. author, 321.
Mahajan, M. R., 322.
Maldonado, J. F. See Andrews, J. S., et al., jt. authors, 328.
Mandrioli, A., 325.
Marcato, A., 334.
Martin, A. R. See Rose, F. L., et al., jt. authors, 339.
Martin, H. M., & Deubler, M. J., 322.
Mather, K., 346.
Matthews, H. T., & Doyle, T. M., 320.
Matthias & Niemand, 310.
Maxon, T. See Rammelkamp, C. H., jt. author, 338.
Mayhew, R. L., 324.
Mazzotti, L., & Osorio, M. T., 341.
Meites, J., & Turner, C. W., 335.
Meleney, H. E., 323.
Mello, A., & Rogick, F. A., 341.
Menju, K., 335.
Menkin, V., 329.
Metzger, H. J., Wakeman, S. A., & Pugh, L. H., 339.
Millar, J. A. S., 338.
Miller, J. T. See Byers, H. G., et al., jt. authors, 337.
Miller, L. L. See Madden, S. C., et al., jt. authors, 330.
Mills, R. C. See Briggs, G. M., Jr., et al., jt. authors, 332.
Mirsky, I. A., Elgart, S., Nelson, N., & Wasserman, P., 330.
Mitscherlich, E., 312.
Miyata, I., 323.
Modes, E., 334.
Möller, H., 327.
Mönnig, H. O., 340.
Mohan, B. N. See Russell, P. F., et al., jt. authors, 317.
Morales Otero, P. See Andrews, J. S., et al., jt. authors, 328.
Morris, H. J. See Nelson, A. A., et al., jt. authors, 326.
Mucciolo, P. See Pires, R. E., jt. author, 325.
Mudaliar, S. V. See Mudaliar, T. V., jt. author, 322.
Mudaliar, T. V., & Mudaliar, S. V., 322.
Müller, F., 336.
Mulligan, H. W. See Russell, P. F., et al., jt. authors, 317.
Munro, J. A. See Telford, H. S., et al., jt. authors, 340.

Naik, R. N., 340.
Najjar, V. A., Stein, H. J., Holt, L. E., Jr., & Kabler, C. V., 332.
Negroni, P., 315.
Nelson, A. A., Fitzhugh, O. G., Morris, H. J., & Calvery, H. O., 326.
Nelson, N. See Mirsky, I. A., et al., jt. authors, 330.
Niemand. See Matthias, jt. author, 310.
Nunemaker, J. C. See Brown, T. M., jt. author, 315.
Nutini, L. G., & Kreke, C. W., 309.

Oelkers, H. A., & Rathje, W., 340.
Olitsky, P. K., Schlesinger, R. W., & Morgan, I. M., 319.
Orr, A. B., 327.
Osorio, M. T. See Mazzotti, L., jt. author, 341.
Osorno-Mesa, E., 322.

Pacchioni, G., 327.
Packchanian, A., 344.
Pallaske, G., 312.
Pande, P. G., 312.
Parker, J. E., & McSpadden, B. J., 334.
Parkhurst, R. T. See Gutowska, M. S., jt. author, 330.
Patterson, G. W. See LeGalley, D. P., jt. author, 341.
Pearsons, J. See Sharpless, G. R., et al., jt. authors, 330.
Peres, C. E., 323.
Peters, R. See Ravdin, I. S., et al., jt. authors, 330.
Petersen, W. E. See Shaw, J. C., jt. author, 335.
Petersen, W. F., 310, *bis*.
Petrie, G. F., & Steabben, D., 314.
Petrini, M. See Sollazzo, G., jt. author, 341.
Pikovski, M. See Doljanski, L., jt. author, 327.
—. See also Pollard, M., jt. author, 327.
Pires, A., 321.
Pires, R. E., 325.
—, & Mucciolo, P., 325.
Pirie, A., 325.
Piringer, W., 318.
Platla, J. L., 312.
Plotz, H., 321.
Pollard, M., & Pikovski, M., 327.
Pottenger, J. E., 343.
Potter, J. S., & Ward, E. N., 326.
Prados, M. See Swank, R. L., jt. author, 331.
Prato, G. S. See Sharpless, G. R., et al., jt. authors, 330.
Princi, S., 318.
Pröscholdt, O., 309.
Pugh, L. H. See Metzger, H. J., et al., jt. authors, 339.
Puissegur, J. A., 337.

Quortrup, E. R., & Sudheimer, R. L., 314.

Racker, E., & Kabat, H., 321.
Radford, C. D., 322.
Rake, G. See McKee, C. M., jt. author, 338.
Ralli, E. P. See Feller, A. E., et al., jt. authors, 331.
Rammelkamp, C. H., & Maxon, T., 338.
Randall, R. McI. See Albanese, A. A., et al., jt. authors, 330.
Randolph, T. G., & Gibson, E. B., 343.
Ranganathan, S., 337.
Rao, B. V. C., 322.
Raper, H. S. See Harper, A. A., et al., jt. authors, 331.
Rathje, W. See Oelkers, H. A., jt. author, 340.
Ravdin, I. S., Thorogood, E., Riegel, C., Peters, R., & Rhoads, J. E., 330.
Reece, R. P., 335.
Reed, J. M. See Williams, O. B., jt. author, 314.
Rhoads, J. E. See Ravdin, I. S., et al., jt. authors, 330.
Riegel, C. See Ravdin, I. S., et al., jt. authors, 330.
Rivers, T. M. See Hoagland, C. L., et al., jt. authors, 318.
Roach, R. W., 309.
Roberts, E. C., & Jones, L. R., 320.
Roberts, L. B. See Feller, A. E., et al., jt. authors, 331.
Robinson, F. H., & Evans, A. C., 342.
Röhrer, H., & Winand, H., 343.
Rogick, F. A. See Mello, A., jt. author, 341.
Rose, F. L., Martin, A. R., & Bevan, H. G. L., 339.
Rosenthal, S. M., 339, *bis*.
Rusch, H. P. See Kline, B. E., et al., jt. authors, 326.
Russel, W. O., & Callaway, C. P., 332.
Russell, J., 344.
Russell, P. F., Mulligan, H. W., & Mohan, B. N., 317.
Rutherford, R. S. G., 317.

Sabol, M. See Sharpless, G. R., et al., jt. authors, 330.
Sachweh, P., 343.
Sarata, U., 333.
Sarles, M. P., 324.
Schalk, A. F. See Hunt, C. H., et al., jt. authors, 331.
Schlesinger, R. W. See Olitsky, P. K., et al., jt. authors, 319.
Schlichting, 313.
Schmidt, 344.
Schmidt, L. H., & Sesler, C. L., 339.
Schwartz, B., 322.
Schwarze, E., 336, *ter*.
Seiferle, E., 336.
Sementini, A., 309, *ter*.
Sen, S. N. See Basu, P. N., jt. author, 314.
Sesler, C. L. See Schmidt, L. H., jt. author, 339.
Shank, R. E. See Hoagland, C. L., et al., jt. authors, 313.
Sharpless, G. R., Pearsons, J., & Prato, G. S., 330.
—, Sabol, M., Anthony, E. K., & Argetsinger, H. L., 330.
Shaw, A. O. See Atkeson, F. W., et al., jt. authors, 342.
Shaw, I. G. See Temperton, H., jt. author, 337.
Shaw, J. C., & Petersen, W. E., 335.
Shearer, G. D. See Blakemore, F., jt. author, 337.
Sheldon, A. J., & Groover, M. E., Jr., 324.
Shepard, H. H., 340.
Shigley, J. F. See Thorp, W. T. S., et al., jt. authors, 328.
Simoni, F., 340.
Skvortsov, A. A., Sokolova, L. N., & Talizin, F. F., 323.
Smadel, J. E. See Hoagland, C. L., et al., jt. authors, 318.
Smith, R. C. See Atkeson, F. W., et al., jt. authors, 342.
Sörrensen, G., 342.
Sokolova, L. N. See Skvortsov, A. A., et al., jt. authors, 323.
Sollazzo, G., & Petrini, M., 341.
Sprick, M. See Hollon, H., et al., jt. authors, 310.
Stader, O. See Lewis, K. M., et al., jt. authors, 344.
Staples, R. R., Hornby, H. E., & Hornby, R. M., 345.
Steabben, D. See Petrie, G. F., jt. author, 314.
Steger, G., 336.
Stein, H. J. See Najjar, V. A., et al., jt. authors, 332.
Steiner, M., & Zuger, B., 311.

—. See also Zuger, B., jt. author, 311.
Stewart, J., & McCallum, J. W., 331.
Stöhr, P., 340.
Sudheimer, R. L. See Quortrup, E. R., jt. author, 314.
Sugiura, K., 329.
Summers, W. A., 325.
Swank, R. L., & Prados, M., 331.
Switzerland. Fed. Contr. infect. Anaemia, 319.
Szues, E. See Gawrilow, W., et al., jt. authors, 325.

Talizin, F. F. See Skvortsov, A. A., et al., jt. authors, 323.
Telford, H. S., Longwell, J. H., & Munro, J. A., 340.
Temperton, H., & Shaw, I. G., 337.
Tenenbaum, E. See Doljanski, L., et al., jt. authors, 329.
Thompson, J. H., Holt, P. F., & Callow, H. J., 326.
Thorogood, E. See Ravdin, I. S., et al., jt. authors, 330.
Thorp, W. T. S., Shigley, J. F., & Farrell, M. A., 328.
Torres, C. M., 316.
Trelease, S. F., Greenfield, S. S., & Di-Somma, A. A., 337.
Tsigaras, C., 331.
Turner, C. W. See Meites, J., jt. author, 335.
Turner, H. H., Lachmann, E., & Hellbaum, A. A., 336.

U.S.A. Changes in U.S. Dep. Agric., 344.
—. Rep. Comm. Dis. affecting Man [Internat. Ass Milk Sanit.], 1940, 342.
Unna, K. See Antopol, W., jt. author, 331.

Vaughn, R. H., & Levine, M., 313.
Vawter, L. R., 314.
Vezzoso, B., 317.
Vogelsang, E. G. See Gallo, P., jt. author, 319.

Wade, L. J., 310.
Waisman, H. A. See Cooperman, J. M., et al., jt. authors, 331.
Waksman, S. A. See Metzger, H. J., et al., jt. authors, 339.
Ward, E. N. See Potter, J. S., jt. author, 326.
Ward, S. M. See Hoagland, C. L., et al., jt. authors, 313, 318.
Wasley, W. L. See Kline, B. E., et al., jt. authors, 326.
Wasserman, P. See Mirsky, I. A., et al., jt. authors, 330.
Watt, J. Y. C., 324.
Webb, A. M. See Loofbourow, J. R., et al., jt. authors, 329.
Wegner, E. E., & Hazlet, S. E., 345.
Weinhouse, S., 333.
Welch, A. D. See Jukes, T. H., jt. author, 332.
Welcher, F., 346.
Weldy, M. L. See Bryan, C. S., et al., jt. authors, 338.
Welsh, M., 345.
Werneck, F. L., 322.
Werner, H., & Doljanski, L., 329.
Whipple, G. H. See Madden, S. C., et al., jt. authors, 330.
White, J. G., 346.
Williams, G. Z. See Forbes, J. C., et al., jt. authors, 341.
Williams, K. T. See Byers, H. G., et al., jt. authors, 337.
Williams, O. B., & Reed, J. M., 314.
Wilson, E. See Hollon, H., et al., jt. authors, 310.
Winand, H. See Röhrer, H., jt. author, 343.
Wood, A. J., & Gunsalus, I. C., 309.

Yakimov, V. L., & Machul'skil, S. N., 317.
Yegian, D., & Kurang, J. M., 310.
—, & Kurung, J., 311.

Zahl, P. L., & Hutner, S. H., 325.
Žarnić, I. See Hupbauer, A., jt. author, 320, *bis*.
Zimmerman, H. E., Jr., 324.
Zimmermann, W., & Heymann, G., 318.
Zittle, C. A. See Henle, G., jt. author, 334.
Zuger, B., & Steiner, M., 311.
—. See also Steiner, M., jt. author, 311.

REVIEW ARTICLES

(1) " Antibacterial Agents derived from Micro-Organisms."

(2) " The Present Position of Phenothiazine as an Anthelmintic."

Reprints (price 1/– and 1/6 respectively) obtainable from: Central Sales Branch (Imperial Agricultural Bureaux), Agricultural Research Building, Penglais, Aberystwyth.

ERRATA

Vol. **13.** pp. 70-71. *SPITALER, W. (1941), for "The presence and severity of kidney functions . . .", read " The presence and severity of kidney dysfunctions."

p. 86. RITA, G. (1940), for " Tentatavi di infezione . . . di pokko . . . ", read " Tentatavi di infezione . . . di pollo . . . "

p. 201. LOVELL, R. (1943), for corrected version of this abst., see *V.B.* **13.** 312.

NOTE.—In certain cases it is not possible to check references in the original publication. Such references are marked with an asterisk.

IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 13.] September, 1943. [No. 9.

DISEASES CAUSED BY BACTERIA AND FUNGI

WOOD, A. J., & GUNSALUS, I. C. (1942). **The Production of Active Resting Cells of Streptococci.**—*J. Bact.* **44.** 333–341. **2043**

The exacting nutritional requirements, the poor powers of synthesis, and an inadequate aerobic mechanism render it difficult to obtain resting preparations of the streptococci. Such resting preparations, however, can be obtained by growing the organisms in a well buffered medium, rich in nitrogen and accessory factors, and low in carbohydrate, followed by washing in neutral phosphate buffer. The cells should be harvested at the end of the logarithmic phase of growth, and the medium in which they are grown should not be more acid than pH 6·8. Dehydrogenase activity could be demonstrated by the Thunberg method. Methylene blue is a satisfactory hydrogen acceptor, provided that the concentration is 1 : 20,000 or less. In stronger concentrations than this, it is toxic to resting cell suspensions of group B streptococci.—D. L. HUGHES.

NUTINI, L. G., & KREKE, C. W. (1942). **The Toxic Effect of Splenic Extracts on Streptococcus hemolyticus.**—*J. Bact.* **44.** 661–666. **2044**

A description of the preparation of an extract of human spleen, which when added to medium prevented the growth of three strains of haemolytic streptococci from different sources. This action was shown to be not merely inhibitory, but germicidal, and occurred in concentrations as low as 0·1%. Similar results were obtained with an ox-spleen extract, but the authors state that preliminary experiments with other organisms seem to indicate that the effect is specific for streptococci.

The factor involved appears to be a distinct chemical substance differing from antibodies and other defence mechanisms. It is resistant to heat and acid and withstands light and air.—E. J. M. HAYWARD.

ROACH, R. W. (1943). **Chronic Contagious Mastitis : Relationship between Clinical Symptoms and Infection with *Streptococcus agalactiae*. [Correspondence].** —*Vet. Rec.* **55.** 124–125. **2045**

R. advances some explanations for the anomalies which occur in mastitis control based on bacteriological testing. For instance, it is not uncommon to obtain milk samples in which there is an abnormal deposit on centrifugation, accompanied by infection with strains of streptococci which are not generally regarded as significant in this disease. This may occur in two or three successive tests before an infection with group B mastitis streptococci can be demonstrated. On the other hand, cases of acute mastitis occur in cows which have shown no premonitory symptoms and which have passed a number of tests, the last test in some instances being made only a few days earlier.

R. suggests two possible explanations for these phenomena :– (1) *Str. agalactiae* may not be the only factor in the causation of chronic contagious mastitis, and (2) many of the methods employed in bacteriological testing may not be sufficiently delicate to detect the presence of *Str. agalactiae*, especially when media containing selective bacteriostatic agents are used.

Despite these suggestions, R. considers that bacteriological testing is the only reliable method for controlling the disease.—D. L. HUGHES.

I. SEMENTINI, A. (1942). Aggiunta di siero di sangue di mammiferi a terreni colturali comuni e sporificazione di germi patogeni e non patogeni. **[Addition of Mammalian Blood Serum to Common Culture Media and Sporulation of Pathogenic and Non-Pathogenic Bacteria].**—*Boll. Soc. ital. Biol. sper.* **17.** 470–471. **2046**

II. SEMENTINI, A. (1942). Sangue *in toto* di volatili aggiunto a terreni colturali comuni e sporulazione di germi patogeni e non patogeni. **[Addition of Avian Whole Blood to Common Culture Media and Sporulation of Pathogenic and Non-Pathogenic Bacteria].**—*Ibid.* 471–472. **2047**

III. SEMENTINI, A. (1942). Agar più sangue di piccione quale terreno per germi cui si voglia inibire la sporulazione. **[Agar Plus Pigeon Blood as a Culture Medium for the Inhibition of Sporulation].** —*Ibid.* 473–474. **2048**

I. Inhibition of sporulation of *Bacillus anthracis* occurred in agar cultures to which had been added and mixed, prior to solidification, small proportions of pig, dog, or white rat serum. *Bacillus subtilis* was, however, not inhibited in sporulation.

II. The same observation was made on cultures composed of agar plus whole blood from geese, ducks, fowls, or turkeys.

III. Pigeon blood from normal or polyneuritic birds had the same effect.—J. E.

*HOPF, L. (1940). Primäre Penistuberkulose beim Bullen. **[Primary TB. of the Penis in a Bull].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 45]. **2049**

A case record. No details in abstract.

PRÖSCHOLDT, O. (1940). Auf dem Wege von der Bekämpfung zur Tilgung der Rindertuberkulose. **[Eradication of Bovine TB.]**—*Berl. Münch. tierärztl. Wschr.* May 3rd. 205–209. **2050**

P. discusses the methods of control of bovine TB. in Germany as carried out under the Ostertag scheme and a new eradication scheme in which, in addition to tuberculin testing, segregation, and elimination of all cases of open TB., sputum samples are taken at intervals of a few months, irrespective of the clinical condition of the animal, and submitted to cultural and biological examination for the presence of tubercle bacilli. In this way, P. found that only 40% of disseminators were detected by bacteriological examination of clinical cases alone. Regular sputum examination of all tuberculin-positive cattle gave a much higher percentage of disseminators. But even with this more vigorous method, the incidence of TB. cannot be reduced to any appre-

ciable degree, as dissemination of tubercle bacilli usually takes place before such cases are detected by bacteriological examination. P. therefore recommends that in small herds (with a low incidence of the disease), all tuberculin-positive cases should be eliminated, and if reintroduction is avoided, these herds can usually be kept free from TB. In larger herds (with a higher incidence of TB.) a combination of the Ostertag and the eradication scheme can be practised with some success.—E. WEISSBERG.

MATTHIAS & NIEMAND. (1943). Augentuberkulose bei einer Katze. **[TB. of the Eye in a Cat].**—*Z. InfektKr. Haustiere.* **59.** 203–210. **2051**

After a short review of ocular TB. in animals, the authors describe a case of secondary metastatic TB. of the choroid of both eyes in a cat with tuberculous pleuro-pneumonia. The choroid contained a number of tuberculous foci, causing displacement of the overlying retina and blindness. The condition is described and illustrated histologically.—J. E.

HOLLON, H., SPRICK, M., CONROY, E., & WILSON, E. (1942). **Silicon Dioxide in Guinea Pig Inoculation for Tuberculosis.**—*Amer. Rev. Tuberc.* **46.** 568–573. [Spanish summary]. **2052**

In an attempt to assess the value of making a preliminary injection of a silicon dioxide suspension into g. pigs at the site of subsequent inoculation of material for TB. diagnosis, 367 specimens of suspect material were tested in duplicate, one of the animals being injected with 1 ml. of colloidal silicon dioxide prior to the diagnostic inoculation. Results indicated that, while silicon dioxide aided the development of tuberculous nodules at the site of inoculation, the average time required to obtain positive aspirations from such nodules was 20 days. Further, in ten instances, positive slide examinations of aspirated-material were not confirmed at autopsy. Accordingly, the authors suggest caution in the application of the silicon dioxide aspiration technique to routine diagnostic procedure.
—J. LOCHIEL MCGIRR.

COLARIETI, F. (1942). Colonie anulari come carattere colturale differenziale del *Mycobacterium avium*. **[Annular Colonies as a Distinguishing Feature of Avian Type Tubercle Bacilli in Culture].**—*Boll. Soc. ital. Biol. sper.* **17.** 450–451. **2053**

C. observed that some of the colonies of avian tubercle bacilli growing on Petragnani's medium assumed a ring or cratered form. According to his experience, mammalian type colonies never have that appearance.—J. E.

*ASAKAWA, S. (1940). **Virulence Studies of Avian Tubercle Bacilli.**—*Kekkaku.* **18.** 1000. [Extract from abst. in *Biol. Abstr.* Sect. F. **16.** No. 9. 20, slightly amended]. **2054**

Using several strains of avian tubercle bacilli, A. made virulence studies in rabbits, with the following results. When virulent organisms were injected intravenously in large amounts, the animals showed the Yersin type reaction; smaller doses resulted in the Villemin type reaction. In the former type of reaction the experimental animals became jaundiced in about seven days after administration and underwent a sudden decrease in body weight. The greatest numbers of injected organisms were found in the liver and spleen, in which were seen globular masses of tubercle bacilli arranged in a spoke-like pattern. Hyperbilirubinaemia, which may be regarded as fairly specific to the effect of avian tubercle bacilli, followed the intravenous administration of organisms. Intraperitoneal injection resulted in an indefinite pathologic picture, and jaundice occurred but irregularly. After subcutaneous injection, the only noticeable changes were those of local necrosis at the site of administration, no systemic manifestations being encountered. Intracutaneous injection of the suspension resulted in localized erythema and ulceration, followed by complete healing of the scar in 1–2 months.

YEGIAN, D., & KURUNG, J. M. (1942). **Retention of Tubercle Bacilli by the Kidney of the Rabbit. Study II.**—*Amer. Rev. Tuberc.* **45.** 442–445. [Spanish summary]. [See also *V. B.* **11.** 149]. **2055**

When healthy and sensitized rabbits respectively are inoculated intravenously with large numbers of tubercle bacilli, the organisms do not appear in the urine within 10–75 min., although acid-fast microorganisms are present in the substance of the kidney at this time. The bacilli are retained by the kidney until the advent of tubercle formation and cellular damage allows them to escape into the urine.—I. W. B.

I. PETERSEN, W. F. (1942). **The Clinical Episode in Tuberculosis and the Meteorological Environment.**—*Amer. Rev. Tuberc.* **46.** 407–417. [Spanish summary]. **2056**

II. PETERSEN, W. F. (1942). **Browning's Meteoropathological Observations in Tuberculosis.**—*Ibid.* 690–696. [Spanish summary]. **2057**

I. P. makes a careful analysis of a series of case records and correlates the onset of various symptoms with adverse climatic conditions. It is pointed out that atmospheric conditions are always varying and that this should be taken into consideration in physiological experiments.

The general nature of these two articles can be udged by the following statement.

> " Actually when once this pendulation of a state of increased resistance and decreased resistance, of decreasing and increasing hydration, of increasing or lessening pH levels, of calcium ionization, of lipoid levels, of leucocytic maturation, of capillary permeability, of pressor levels, etc. becomes common clinical property, the evaluation of the clinical picture, the management of the patient and the prognosis should, I think, be materially facilitated ".

II. Further correlations are given between clinical symptoms and changes in atmospheric conditions. In Los Angeles, the equinox is more difficult for the tuberculous patient than other periods of the year.

[A very useful account of the effect of climate on man and animals has been given by C. A. MILLS in " Medical Climatology " (1939. pp. 296. London: Baillière, Tindall & Cox). MINETT in his presidential address to the 30th Indian Science Congress (1943. Part II of the Congress *Proceedings*) indicated the part played by weather changes in the pathogenesis of certain animal diseases.]—JOHN FRANCIS.

LICHTENSTEIN, M. R. (1942). **Tuberculin Reaction in Tuberculosis During Pregnancy.**—*Amer. Rev. Tuberc.* **46.** 89–92. [Spanish summary]. **2058**

A study of cutaneous tuberculin sensitivity in 82 pregnant tuberculous human patients revealed that in most instances the level of skin reactivity was comparable to that of similar, non-pregnant patients. In about 25% of the cases a marked depression of sensitivity occurred in the later months of pregnancy. This reduced reactivity tended to return to the normal level shortly after delivery.—J. LOCHIEL MCGIRR.

WADE, L. J. (1942). **The Effect of Pregnancy upon Experimental Tuberculosis in Rabbits.**—*Amer. Rev. Tuberc.* **46.** 93–100. [Spanish summary]. **2059**

The effect of one or more pregnancies upon the course of TB. induced in rabbits by the intravenous inoculation of 0·00001 mg. of the Ravenel strain of bovine bacilli was investigated, the object being to determine whether pregnancy influenced the course of

pulmonary TB. [In rabbits, the above inoculation procedure apparently produces a chronic, predominantly pulmonary, infection with a fair degree of resemblance to "the delicate balance between asymptomatic or latent infection and progressive manifest disease that is characteristic of human tuberculosis" (see OPIE & FREUND—*V. B.* **8.** 688).] A comparison of infected animals which had undergone 1–3 pregnancies with similar virgin animals revealed no statistically significant difference in the duration of life and the extent of the disease at death. Cutaneous tuberculin sensitivity was unaffected by pregnancy, but showed a transient decrease following parturition [see also LICHTENSTEIN above]; pregnancy did not seem to retard the appearance of complement-fixing antibodies.—J. L. McGIRR.

STEINER, M., & ZUGER, B. (1943). **Allergy and Immunity in Tuberculosis. I. Immunization and Reinfection of Guinea-Pigs with Homologous Variants of the Human Tubercle Bacillus H37.**—*J. Immunol.* **46.** 83–90. **2060**

ZUGER, B., & STEINER, M. (1943). **Allergy and Immunity in Tuberculosis. II. Relationship of Tuberculin Cutaneous Reactivity to Experimental Infection in the Guinea-Pig.**—*Ibid.* 91–99. **2061**

I. Utilizing the method of STEENKEN *et al.* [*V. B.* **5.** 61.] to effect the dissociation of a rough avirulent (Ra) variant from the virulent (Rv) human strain of tubercle bacillus H37, the character of the immunity induced in g. pigs by the Ra strain was investigated. Eight groups of animals were given subcutaneous sensitizing injections of the organism H37Ra at intervals varying from 2–52 weeks before being reinfected with the virulent homologue H37Rv. Only minimal lesions, at the site of inoculation, were induced as a result of the primary Ra infection, and results indicated that the avirulent organism was capable of inducing a considerable degree of immunity against infection with the virulent homologue. This immunity was demonstrable as early as two weeks and as late as one year following the primary infection, and was manifested by a delay in the onset of fatalities, by the absolute survival of a small number, and, particularly, by a significant prolongation in the survival periods of the test animals as compared with controls.

II. In this paper the data of I are analysed in an attempt to evaluate the possible influence of the cutaneous sensitivity to tuberculin, present at the time of reinfection, upon the immunity induced by the primary infection. It was found that animals with developing cutaneous sensitivity, peak sensitivity, waning sensitivity, and zero sensitivity fared equally well in their resistance to reinfection. The authors are careful to point out that this paper evaluates the role of cutaneous sensitivity only at the time of reinfection, and does not attempt to evaluate the stimulated cutaneous sensitivity that follows reinfection.—J. L. McG.

YEGIAN, D., & KURUNG, J. (1942). **Response of Scar Tissue to Tuberculin.**—*Amer. Rev. Tuberc.* **46.** 196–198. [Spanish summary]. **2062**

The inflammatory response to tuberculin of traumatic scars of the skin in tuberculous human patients and experimentally infected g. pigs was found to be comparable with that of the adjacent normal skin. The location and age of the scar did not appear to affect materially the extent of the tuberculin reaction, and, as was demonstrated in g. pigs, the fibrous tissue developed in experimentally produced cutaneous scars gave a similar tuberculin response to that of the normal skin, irrespective of whether the animals were infected six months before, or six months after, the production of the skin lesion.—J. LOCHIEL McGIRR.

CLARK, L. T., & FOLLIN, S. F. (1942). **Quantitative Standardization of Tuberculin Purified Protein Derivative.**—*Amer. Rev. Tuberc.* **46.** 77–88. [Spanish summary]. **2063**

A method, dependent on the use of controlled sensitization of the g. pig, is presented for the quantitative standardization of human P.P.D. tuberculin. Its salient features are as follows :– the use of g. pigs with white or light-coloured skins and weighing 425–450 g., sensitization by intraperitoneal inoculation of virulent human type tubercle bacilli in a dose of 0·1 ml. of a suspension of density equal to a no. 1 tube McFarland's nephelometer, use of two sensitized g. pigs and one normal g. pig for control in each test, discarding of animals which lose weight after infection, testing on clipped, depilated g. pigs after a four-week sensitization period, use of 0·1 ml. intracutaneous doses of 5 dilutions of the test P.P.D. ranging from 0·005–0·00001 mg. per dose, placing of test doses on one side of the median line of each g. pig with like doses of the standard P.P.D. on the other side, recording of reactions at 24- and 48-hour intervals, the entire area of erythema and concentric area of blanching, oedema, or necrosis being noted.—J. LOCHIEL McGIRR.

CABASSO, V. (1940). Préparation d'une tuberculine très active à partir d'un bacille acido-résistant saprophyte. **[Preparation of Active Tuberculin from a Saprophytic Acid-Fast Bacillus].**—*Arch. Inst. Pasteur Tunis.* **29.** 285–289. **2064**

Filtrates, obtained from heat-killed Sauton medium cultures of an acid-fast bacillus which was isolated from the body of a fly and shown to be non-pathogenic for the mouse and g. pig, were found to possess considerable tuberculin activity when tested intradermally and intraperitoneally on g. pigs infected with human tubercle bacilli. A xanthoproteic test indicated the presence of protein in the medium by the seventh day of incubation, and the amount of protein appeared to rise steadily thereafter, reaching a maximum about the 80th day. By the end of 4–5 weeks the pH of the medium, originally 7·1, had fallen to 4·2. The results obtained in tuberculous g. pigs by intradermal injections of 0·2 ml. of filtrates from these cultures indicated that they possessed a tuberculin activity which increased to a maximum after about 80 days' incubation. A 3 ml. intraperitoneal injection of the 80-day culture filtrate resulted in the death of tuberculous g. pigs within 24 hours, while the intradermal injection of 0·2 ml. of a 1 : 10 dilution of a heat-concentrated specimen of this filtrate produced a papule 0·75 cm. in diameter within 24 hours. According to C., the 80-day culture filtrate of this organism possessed tuberculin activity comparable with that of "classical, crude tuberculin". [No values for the protein contents of the culture media or filtrates are indicated.]—J. LOCHIEL McGIRR.

ETCHEVERRY, J. C. (1942). Contribución al estudio de la vacunación antituberculosa B.C.G. por el método de las punturas múltiples de Rosenthal. **[On BCG Inoculation by Rosenthal's Method of Multiple Punctures].**—*Hoja Tisiol.* **2.** 38–40. [Abst. in *Tubercle, Lond.* **23.** 261, copied *verbatim*]. **2065**

The author has found that by reducing the number of punctures and distributing them over various small areas of skin, the principal cause of an accumulation of irritative stimuli is avoided especially when concentrated emulsions of B.C.G. are used (1 gramme of B.C.G. in 10 c.c. of Sauton's 10 per cent glycerinated fluid).

*CHISSTOVICH, & GIRBASSOVA, L. V. (1940). **[Course of Experimental Bone TB. in Animals Vaccinated with BCG].**—*Vestn. chir.* **60.** 368–373. [In Russian]. [Abst. from abst. in *Jber. Vet.-Med.* **68.** 503]. **2066**

Rabbits that had been given BCG vaccine were infected with bovine type tubercle bacilli in the femorotibial joint. An acute lesion developed and then regressed, whilst in unvaccinated control rabbits a progressive and fatal lesion developed.

PANDE, P. G. (1942). **Paratuberculosis (Johne's disease) in Goats at the Government Cattle Breeding Farm, Sylhet, Assam.**—*Indian J. vet. Sci.* **12.** 160–164. **2067**

An account of an outbreak of Johne's disease in a herd of goats which had been transferred six months previously from another cattle farm to the Sylhet farm which was then heavily infected with Johne's disease. The disease was at first confused with parasitic gastro-enteritis, but was later confirmed as Johne's disease by autopsy of four goats which had shown emaciation, watery diarrhoea, and swelling under the jaw. P.M. examination revealed thickening and corrugation of the mucous membrane of the intestine, besides oedema and enlargement of the mesenteric lymph nodes which also contained caseous foci similar to those described by MCFADYEAN & SHEATHER. Diagnosis was further confirmed by microscopic examination of smears and by cultural and histopathological examinations. From the history, P. thinks that infection was acquired from diseased cattle on the premises and that the incubation period in the goats was about six months.—L. SAHAI.

LOVELL, R. (1943). **The Source of Corynebacterium pyogenes Infections.**—*Vet. Rec.* **55.** 99–100. Discussion p. 100. **2068**

The question is discussed whether the origin of *Corynebacterium pyogenes* infection is the sudden appearance, through contagion, of the organism in a susceptible host or the resuscitation, by some secondary factor, of the organism already in the host. Evidence is presented which largely supports the second view. It is suggested that in the case of summer mastitis, the irritation set up by flies may assist in the production of the condition. There is no definite indication of any factor which initiates endometritis and pyometra in cattle, but indiscriminate and undue interference with the genital tract appears to be undesirable ; interference with the oestral cycle may also be dangerous. An alum-precipitated toxoid has been prepared and is undergoing a field trial. Cows receive two doses of 10 ml. subcutaneously with an interval of 6–8 weeks.

[This abstract is substituted for abstract number 1341 (*V. B.* **13.** 201.), which gave an erroneous account of the author's conception of the nature of " summer mastitis ". The editor accepts responsibility for this error.]—D. D. OGILVIE.

MITSCHERLICH, E. (1942). Verfohlen durch Corynebacterium pyogenes equi. [**Abortion from** *Corynebact. equi* **Infection**].—*Berl. Münch. tierärztl. Wschr.* Dec. 11th. 366–367. **2069**

After reviewing the literature on *Corynebact. equi* infection in equines, M. describes a case in a foal aborted at nine months. Its lungs contained innumerable pea-sized, yellow-violet solid nodules, which gave them a tough consistency. The bronchial lymph nodes were swollen and very moist. The liver was somewhat reduced in size, was orange tinted and showed prominent lobulation. The spleen was soft and steel blue in colour.

The mare suffered partial retention of the placenta, which fact is taken to indicate uterine infection and abortion caused by this organism, which was isolated from the foetal lungs and identified.—J. E.

*FLATLA, J. L. (1942). Infeksjon med Corynebacterium equi hos føll. [*Corynebact. equi* **Infection in Foals**].—*Norsk VetTidsskr.* **54.** 249–276 & 322–337. [Abst. from abst. in *Skand. VetTidskr.* **32.** 633 and 637–639]. **2070**

After a rambling account of illnesses and deaths over many years in mares and foals at a breeding stud, a systematic description is given of the typical disease in the foals.

Signs of disease appeared in foals of 1–4 months old. They lost condition, began to cough, and showed progressive respiratory difficulty. There was slight nasal discharge and swelling of the lymph nodes of the head. Body temperature remained normal until the later stages, when it rose. A minority of cases died after a few days' illness, but most took a chronic course and died after weeks or months.

Autopsy showed miliary abscess formation in the lungs, intestines, and their lymph nodes, but none in the liver, spleen, or kidneys. The abscesses contained thin pus from which *Corynebacterium equi* was isolated. Specific serum treatment is said to be useful for preventive purposes.—J. E.

BARBONI, E. (1942). Le alterazioni del pancreas nel mal rossino acuto dei suini. [**Changes of the Pancreas in Swine Erysipelas**].—*Nuova Vet.* **20.** 152–156. **2071**

Studies were made of the pancreas in 30 pigs which had died of acute septicaemic S.E. The lesions consisted in parenchymatous degeneration and necrosis, apparently brought about by thrombosis of the capillaries.—MILLER WATSON.

PALLASKE, G. (1943). Weitere Untersuchungen über die Listerellainfektion der Schafe. [**Further Research on Listerella Infection in Sheep**].—*Z. InfektKr Haustiere.* **59.** 125–145. **2072**

P. recapitulates his previous report on listerellosis in sheep in Germany [*V. B.* **12.** 571.] and gives a systematic description with special reference to symptoms and pathology. He discusses the pathogenesis and describes experiments on artificial infection. All attempts to infect sheep with culture *via* the naso-cerebral tract, by the middle ear, or by the alimentary tract failed, so no light was shed upon the problem of neurotropism of the organism.

P. reports this disease in sheep from a number of different parts of Germany : it is thus not limited to Neumark-Grenzmark as previously stated.—J. E.

HENRICSON, T. (1943). Ett fall av listerellos hos hare. [**Listerellosis in a Hare**].—*Svensk VetTidskr.* **48.** 1–9. [English summary]. **2073**

A description of the bacteriological diagnosis of *Listerella monocytogenes* infection in a hare which died naturally. It was pathogenic and lethal for rabbits, g. pigs, mice, fowls, and a pigeon. Agglutinating antibodies were rapidly formed in the serum of an infected rabbit.—J. E.

CICCONI, M. (1942). Fehlende Pigmentbildung von Pyocyaneuskulturen auf einem neuen Nährboden aus Reiskleie. Nachweis eines Hemmungsstoffes neben einem Mangelfaktor. [**Lack of Pigment Formation by** *Pseudomonas pyocyanea* **on a New Rice-Bran Medium**].—*Zbl. Bakt. I.* (*Orig.*). **149.** 102–110. **2074**

The failure of pigment production when *Ps. pyocyanea* was grown on this medium [see *V. B.* **13.** 36.] was due to an inhibitor present in the extract and also found in liver extract, yeast, and malt. Its action could be prevented by the addition of a great excess of alanine. Much information, for which the original should be consulted, is also given on the action of chemicals on pigment formation by this organism.—J. G. CARR.

HOAGLAND, C. L., WARD, S. M., GILDER, H., & SHANK, R. E. (1942). **Studies on the Nutrition of of *Hemophilus influenzae*. I. The Relationship between the Utilization of Coenzyme and Hemin and the Reduction of Nitrate.**—*J. exp. Med.* **76.** 241–252. **2075**

Previous studies have often yielded conflicting results because the conditions were not sufficiently standardized ; in the present experiments the conditions were investigated under which growth and consequent metabolic activity of *H. influenzae* could be correlated with the total coenzyme, or V-factor, content of the medium. A basal medium composed of 2% Difco proteose peptone, 0·6% NaCl, and 0·2% sodium or potassium nitrate was employed. Except when the effect of haemin concentration (X factor) was being tested, 1% autoclaved red cells were added to the medium after sterilization. V-factor was prepared from yeast and its purity estimated. The final growth was determined by estimating the amount of nitrate that had been reduced to nitrite. Tests were carried out in 50 ml. Erlenmeyer flasks, as irregular results were obtained in test tubes. It was shown that the inoculum did not contain sufficient growth substances to support growth in the basal medium.

It was found that additional factors, either organic, inorganic, or both, in addition to haemin and coenzyme, may enhance the growth of *H. influenzae* in the basal medium, and that these are maximally supplied by 0·5% autoclaved blood. A large number of possible substances were tested, but none had the stimulating effect of autoclaved whole blood. It was also shown that various media used for the determination of coenzyme by the growth of *H. influenzae*, have often been deficient in X-factor, and that this substance, rather than coenzyme, has been the specific factor limiting growth. When X-factor and other specific substances required for the optimum growth of *H. influenzae* are present in excess, the nitrite produced by this organism is quantitatively related to the concentration of V-factor, or total coenzyme.

These studies have formed the basis for a quantitative method for the determination of total coenzyme in blood and tissue. This method is being described elsewhere.—JOHN FRANCIS.

GRIFFITHS, S. D. (1942). **Ants as Probable Agents in the Spread of Shigella Infections.**—*Science.* **96.** 271–272. **2076**

Tropical fire ants were incriminated in Puerto Rico as possible vectors of dysentery bacilli by allowing a number of shigella- and salmonella-free ants to walk over the surface of sterile MacConkey and S.S. agar plates at stated intervals after access to food inoculated with *Bacterium flexneri V*. Experimental results showed that the ants could carry bacteria on their feet from one place to another for at least 24 hours after feeding on, or traversing, infected material.—R. O. MUIR.

VAUGHN, R. H., & LEVINE, M. (1942). **Differentiation of the " Intermediate " Coli-Like Bacteria.**—*J. Bact.* **44.** 487–505. **2077**

The metabolic characteristics of 223 cultures of intermediate *coli*-like bacteria, obtained from a wide variety of sources, including the faeces of human beings and of fowls, fowl eggs, milk, oysters, olives, water, and soil, were studied to determine their taxonomic status. Criteria are described for the differentiation of the intermediate group from true *Escherichia* and *Aerobacter*. The intermediate strains were found to be markedly group-specific in their reaction to bacteriophages and to metabolites from staled agar. 196 strains were assigned to one species (*E. freundii*) and 27 to another (*E. intermedium*), on the basis of hydrogen sulphide production in proteose peptone ferric citrate agar. The second species could be subdivided according to motility and fermentation of starch and inosite.—R. O. MUIR.

SCHLICHTING. (1942). Bruzellosebekämpfung auf der Krim. **[Control of Brucellosis in the Crimea].**—*Berl. Münch. tierärztl. Wschr.* Oct. 30th. 322–323. **2078**

S. states that in 1941 there were 710,000 sheep, 105,000 cattle, 81,000 horses, 40,000 pigs, and 22,000 goats in the Crimea. Abortions in sheep have caused losses for many years and since 1933 the Soviet veterinary authorities have carried out a mass brucellosis control scheme in farm animals and farm workers. Allergic tests on sheep and cattle showed incidences of 20% and 10–15% brucella infection respectively in these animals and agglutination tests showed that 1–3% of the other farm animals were infected. As many as 50% of the workers on collective farms also reacted. All reacting animals were removed and segregated on special farms and the cleansed herds were easily preserved from reinfection as there is no movement of animals between farms.

It was not determined to what extent *Br. abortus* and *Br. melitensis* have been concerned in animal and human brucellosis in the Crimea.—J. E.

DINTER, Z. (1943). Die Schnelldiagnose des Rauschbrands mit der Deckglaskultur nach Fortner. **[Rapid Diagnosis of Blackleg by Fortner's Coverglass Culture Method].**—*Z. InfektKr. Haustiere.* **59.** 211–219. **2079**

The technique of the coverglass method is described. In comparison with the ordinary Petri dish plating method, D. claims that the coverglass method is more reliable and more rapid as well as being sparing of materials, and that it is the simplest, quickest, and surest method of diagnosing blackleg. The *Clostridium chauvoei* colonies are looked for after six and 12 hours' incubation. Diagnosis is made at the 12-hour inspection, when the contaminants have not swamped the *chauvoei* colonies, as is often the case with Petri-dish colonies examined after the usual interval of 24 hours' incubation.

The method of isolating *Cl. chauvoei* from coverglass colonies is also described.—J. E.

HARMS. (1942). Schafrauschbrand in der Provinz Hannover. **[Blackleg in Sheep in Hanover Province].**—*Berl. Münch. tierärztl. Wschr.* Oct. 30th. 319–321. **2080**

Blackleg was diagnosed bacteriologically from the carcasses of representative ewes sent from two separate districts in the province of Hanover. In the first flock, annual losses among the ewes had occurred a short time after lambing for some years past, presumably all from blackleg. Symptoms included discharge from nostrils and mouth, and swellings along the head, neck, and shoulder, with death in 24–36 hours.

In the second flock losses of ewes occurred at lambing time, and it is stated that this was also shearing time. In this case the ewes showed blackleg swellings of the perineal region (the so-called " parturient blackleg ") as well as on the fore part of the body.

[In his introduction, H. states that blackleg in sheep is typically a wound infection. He labels the disease of both flocks " parturient blackleg ", although there were no perineal lesions in ewes of the first flock (and no loss after shearing which took place later) and although infection appeared to follow shearing wounds in ewes of the second flock. The interconnexion between parturition and wound injury appears obscure.]

Sheep blackleg areas exist just like cattle blackleg areas, and they are quite distinct in Germany. These areas are listed.—J. E.

VAWTER, L. R. (1942). **Recovery of Clostridium Sordellii from Cattle and Sheep.**—*Amer. J. vet. Res.* **3.** 382–386. **2081**

Since 1921, six strains of *Cl. sordellii*, all antigenically identical, have been recovered by V. from animals; five were from cattle with bacillary haemoglobinuria and the sixth from a sheep with braxy-like disease.

In all cases other anaerobes, *Cl. welchii*, *Cl. haemolyticum* (the cause of bacillary haemoglobinuria) or both of these together, were present in the tissues from which *Cl. sordellii* was isolated.

All strains of *Cl. sordellii* except that from the sheep, produce a very potent toxin and are pathogenic for laboratory animals, sheep, cattle, and horses. The biological characters of the organisms are described in detail.

The author suggests that the organism was present in the soil and on the hair of the cattle that were affected and that it was mechanically introduced into the tissues at the time of vaccination.—M. H. KYAW.

PETRIE, G. F., & STEABBEN, D. (1943). **Specific Identification of the Chief Pathogenic Clostridia of Gas Gangrene.**—*Brit. med. J.* March 27th. 377–379. **2082**

Colonies of *Cl. welchii*, *Cl. septicum*, and *Cl. oedematiens*, are shown to produce opaque haloes when grown on agar plates containing their specific antitoxins. For *Cl. oedematiens* the agar should be enriched with 10% horse-muscle extract [see *V. B.* **12.** 335]; for *Cl. welchii*, 10% muscle extract and 0·5% glucose is recommended, and for *Cl. septicum*, 10% inactivated normal horse serum with 0·5% glucose. The above enrichments may be added to measured tubes of nutrient agar immediately prior to the plates being poured and at the same time sufficient of the appropriate antitoxin is added so as to give a final concentration of approximately 8 I.U. per ml. in the poured plate. The plates should be dried for several hours, then inoculated and examined after 24 or 48 hours' anaerobic incubation. The plates should subsequently be kept for some days at room temperature, as the haloes of *Cl. oedematiens* may be slow in appearing. The medium used must be favourable for toxin production, and for toxic strains it is important to have the antitoxin present in a final concentration of 4–8 I.U. per ml. An alternative technique using the same constituents in deep agar is mentioned.—J. KEPPIE.

QUORTRUP, E. R., & SUDHEIMER, R. L. (1942). **Research Notes on Botulism in Western Marsh Areas with Recommendations for Control.**—*Trans. 7th. N. Amer. Wildl. Conf., 1942.* pp. 284–293. **2083**

A short report providing further incriminating evidence that *Clostridium botulinum* Type C is the cause of western duck sickness. Among the possible causative agents which are now proved unimportant are selenium, encephalomyelitis, and poisonous algae. There is paralysis of the nictitating membrane in the large majority of cases, and a large proportion of birds recover if treated with Type C antitoxin. The term "limber-neck" is an incorrect description of botulism in waterfowl, as the whole of the body and not only the neck becomes paralysed. Measurable amounts of botulinus toxin were found during surveys of typical sickness areas in the following natural sites:—moist organic mud, shallow stagnant water, decaying vegetation, and in the vicinity of drifting carcasses. Practical measures for control and prevention are described, their aim being to remove sources of infection and also marshy overgrown areas which are liable to become infected.—J. K.

WILLIAMS, O. B., & REED, J. M. (1942). **The Significance of the Incubation Temperature of Recovery Cultures in Determining Spore Resistance to Heat.**—*J. infect. Dis.* **71.** 225–227. **2084**

The heat-resistance of the spores of *Clostridium botulinum* (Types A and B) and a putrefactive sporing anaerobe was studied with a view to determining the optimal temperature for the incubation of the subcultures made from the heated spore suspensions. The incubation temperatures tested were:—37°, 31°, 27°, 24°C. The spores, after being boiled for 30–90 min., always grew better on being incubated at 27° or 24°C. The view that 37°C. is above the optimal temperature for the growth of *Cl. botulinum* is confirmed.—J. K.

DACK, G. M., & HOSKINS, D. (1942). **Absorption of Botulinum Toxin from the Colon of Macaca mulatta.**—*J. infect. Dis.* **71.** 260–263. **2085**

Certain surgical measures in monkeys involving the ileum and colon permitted the introduction of potent Type A botulinus toxin into the colon through fistulae. Doses of toxin which were lethal when fed orally were without effect when introduced directly into the colon. Heavy doses by this route caused late symptoms and death in one monkey, indicating slight and very slow absorption from the colon.—J. KEPPIE.

BASU, P. N., & SEN, S. N. (1941). **A Peptic Digest Broth for the Formation of *Clostridium tetani* Toxin.**—*Indian J. med. Res.* **29.** 689–690. **2086**

A description of a peptonized veal digest broth in which good toxin was produced.—BALWANT SINGH.

KOLMODIN, P. I. (1942). Några fall av botryomykos med mindre vanlig lokalisation. **[Cases of Botryomycosis with Unusual Location].**—*Skand. Vet-Tidskr.* **32.** 145–149. [English summary]. **2087**

Using the records of the State Veterinary Laboratory in Stockholm, K. describes the occurrence of botryomycosis in unusual sites in the horse. These include disease of the cerebral meninges and of the external genital organs, a previous description of which has not been found by K.; other examples are affections of the thoracic vertebrae and the ribs, and metastases in the lungs, liver, and diaphragm from a primary inguinal lesion. The clinical symptoms and the naked eye and microscopic P.M. findings are described.—G. B. BROOK.

HOFFERBER. (1942). Über die Stachybotryotoxikose der Pferde. **[Stachybotriomycosis in the Horse].**—*Z. Veterinärk.* **54.** 229–234. **2088**

This is an abstract of a pamphlet [original not available: possibly a military pamphlet] dealing with the prevention and control of a fungous infection of horses caused by *Stachybotrys alternans*. The disease is common in the Ukraine, is brought about by infected straw, hay, or chaff, and is not contagious. The first symptoms after ingestion of the fungus are swelling of the lips, stomatitis, and inflammation of the submaxillary lymph nodes. Fissures in the lips and desquamation of the skin also occur. The second stage consists of gastro-enteritis, sweating, and urticaria and lasts 8–40 days, depending on the amount of fungus ingested. There is thrombopenia and leucopenia and the blood clots very poorly or not at all. The third stage is manifested by pyrexia, rise in pulse rate, and the appearance of necrotic foci in the buccal and nasal mucosa. The leucocyte count may fall as low as 1,000 per cu.mm. and the platelet count may be only 10–20 per 3,000 red cells. The blood may still fail to clot.

Ingestion of very large quantities of infected food causes symptoms to appear within 5–10 hours. They include pyrexia, fast weak pulse, haemorrhages in the mucous membranes, pulmonary oedema and congestion, accelerated respiration, and cyanosis. Nervous symptoms are sometimes seen. The blood shows leucocytosis

and normal coagulability. This form of the disease may be fatal within 24 hours.

P.M. findings include haemorrhages in the mucous and serous membranes, subcutaneous tissues, and musculature; necrotic foci in various parts of the alimentary tract, especially in the large intestine; pulmonary oedema and congestion.

The methods to be adopted for preventing infection of fodder are dealt with in detail. Straw is the usual source of infection and the fungus can develop only when the material is moist. Sites for hay and straw ricks should be changed yearly and hayricks are to be thatched only with sound straw. Everything should be done to avoid damp conditions in straw or hay.

Treatment of affected animals is largely symptomatic, but in the late stage calcium chloride should be given intravenously and adrenalin subcutaneously, followed ½-1 hour later by intravenous potassium iodide. Infected stalls must be thoroughly disinfected and the manure stacked for at least 1–2 months before being used.

H. states that the fungus also attacks the mucous membranes and skin of man, so that it is important that workers should wear protective clothing, cotton wool masks, and eye shields.

Diagnosis of the disease in the horse in the early stage is easy but at a later stage is more difficult; leucopenia and defective coagulation are characteristic. The latter is determined by allowing blood to stand for about 24 hours in a warm place (25°–35°C.) and comparing it with normal horse blood kept under the same conditions. If carried out at intervals of ten days, this procedure is useful in making a prognosis; the clot becomes firmer and the amount of serum expressed increases from almost none to the normal proportion as health improves.—E. G. White.

Negroni, P. (1941). Epidemia de tiña en caballos producida por el Trichophyton flavum. **[Epidemic in Horses of Ringworm Produced by *T. flavum*].**—*Rev. argent. Dermatosif.* **25.** 363–368. **2089**

A conventional description of the detection of *T. flavum* in a few horses affected with ringworm, in the region of Buenos Aires.—J. E.

Brown, T. M., & Nunemaker, J. C. (1942). **Rat Bite Fever. A Review of the American Cases with Re-evaluation of Etiology.**—*Johns Hopk. Hosp. Bull.* **70.** 201–328. **2090**

Following a historical summary of the literature on rat-bite fever for which different agents have been incriminated in the past, a detailed account is given of the clinical features, laboratory diagnosis, and clinical analysis of rat-bite fever due to *Spirillum minus*, together with a description of the disease as observed in the U.S.A.

Varied Nomenclature for Streptobacillus moniliformis

Year	Author	Organism	Source
1914	Schottmüller	*Streptothrix muris ratti*	Blood of a human being bitten by a rat.
1914	Schottmüller	*Streptothrix teraxeri cepapi*	Blood and pus of a human being bitten by a squirrel.
1916	Tunnicliff	*Streptothrix*	Lungs of rats showing broncho-pneumonia.
1917	Litterer	*Streptothrix longus* and *brevis*	Blood of human beings bitten by rats.
1918	Dick and Tunnicliff	*Streptothrix putorii*	Blood of a human being bitten by a weasel.
1918	Tunnicliff and Mayer	*Streptothrix* closely related to *Streptothrix putorii*	Heart blood of a human being dying following rat bite.
1918–1921	Smith	*Bacillus actinoides*	Lungs of calves dying of pneumonia.
1922	Jones	Organism resembling *Bacillus actinoides*	Lungs of rats showing pneumonia.
1923	Bergey *et al.*	*Actinomyces actinoides*	Proposed name for Smith's *Bacillus actinoides*.
1925	Levaditi *et al.*	*Streptobacillus moniliformis*	Blood from a spontaneous human infection without rat bite.
1926	Parker and Hudson	*Haverhillia multiformis*	Blood of human beings following epidemic from use of non-pasteurized milk.
1929	Topley and Wilson	*Actinobacillus actinoides*	Proposed name for Smith's *Bacillus actinoides*.
1930–1931	Nelson	*Bacillus actinoides* var. *muris*	Diseased middle ears of rats.
1932	Levaditi *et al.*	*Streptobacillus moniliformis*	Blood of mice showing "spontaneous infectious rheumatism".
1933	Strangeways	*Streptobacillus moniliformis*	Nasopharynx of laboratory rats.
1933	Mackie *et al.*	*Streptobacillus moniliformis*	Epizootic disease in laboratory mice; found in blood and organs.
1934	Scharles and Seastone	*Haverhillia multiformis*	Joint fluid of a human being bitten by a laboratory rat.
1936	Topley and Wilson	*Actinomyces muris*	Proposed name for organisms of Schottmüller, Levaditi, and Parker and Hudson.
1939	Bergey *et al.*	*Actinobacillus actinoides*	Acceptance of Topley and Wilson's proposed name for Smith's *B. actinoides*.
1940	Nelson	*Actinobacillus muris*	Proposed name for organism previously isolated from infected ears of rats.
1941	Sabin	*Murimyces streptobacillimoniliformis*	Proposed name for the L_1 component of *Streptobacillus moniliformis*.
1941	Heilman	*Asterococcus muris*	Proposed name for organism isolated both from blood of a human being bitten by a rat and from rat middle ears.

A tabular analysis of 80 cases, occurring in the U.S.A. since 1916, with the clinical picture of "rat-bite fever," is included; this gives the evidence that certain animals (bites of rats, mice, a weasel and cats, a scratch by a cat, and dog contact have been incriminated) are considered to play the role of carriers. Sixty-two cases followed rat bites and of these 22 were due to *Sp. minus*, 11 to *Streptobacillus moniliformis*, six to a "*Streptothrix*" of unstated species, two to a "*Sporothrix*", and one to an unnamed spirochaete, while 18 were of an unspecified nature; also one case was presumably due to *Sp. minus* and another presumably due to *Str. moniliformis*. One case of *Sp. minus* infection was of doubtful rat-bite origin. Of the 17 remaining cases due to causes other than rat bite, one was caused by a weasel bite (*Str. moniliformis* infection), four by mouse bites (two due to *Sp. minus* infection and two to unstated causes), two by cat bites and two by cat scratches (all *Sp. minus* infections), four by dog contact (*Sp. minus* infection) and four by trauma (two due to *Str. moniliformis* and two to *Sp. minus* infection).

A review of the literature on *Str. moniliformis* precedes a clinical analysis of Haverhill fever (the term applied to a condition first described as occurring at Haverhill, Massachusetts, U.S.A. in 1926), caused by *Str. moniliformis*, but unassociated with rat bite, and a description of the symptoms, clinical analysis, and case reports of infections due to *Str. moniliformis* following rat bites and of presumptive diagnosis of additional cases by agglutination to that organism.

The biology of *Str. moniliformis* is then discussed at length with regard to cultural methods and growth requirements, bacteriological classification, the L_1 pleuro-pneumonia-like micro-organism of Klieneberger, serology, animal pathogenicity, and therapeutic treatment.

The nomenclature used for *Str. moniliformis* is given in the accompanying table.

The evidence presented by the authors establishes *Str. moniliformis* as the cause of eight cases of rat-bite fever and demonstrates the specificity and value of agglutination in diagnosis. The protective action of an organic gold preparation is stressed in contrast to the failure of sulphonamide therapy.

The consistent reversion of five strains of the L_1 pleuro-pneumonia-like micro-organism to the *Streptobacillus* with appropriate culture led the authors to conclude that the L_1-*Streptobacillus* relationship was one of bacterial variation and not symbiosis.

It is suggested that *Str. moniliformis* is more frequently the cause of "rat-bite fever" than is *Sp. minus*. —R. O. Muir.

Buer, A. W. (1942). Über Luftsackmykose beim Pferd. [**Mycosis of the Guttural Pouch in the Horse**]. —*Skand. VetTidskr.* **32**. 593–609. [In German: English summary]. **2091**.

B. describes three fatal cases of mycosis of the guttural pouches in horses in Norway. Death was due in each case to haemorrhage from the internal carotid artery which crosses the pouch. Parts of the mucous membrane of the pouch were attacked by the mould and became necrotic over a variable area and the process spread to the wall of the artery causing rupture preceded or not by aneurysm formation. From one case a *Penicillium* was isolated.

B. unsuccessfully attempted to produce the condition experimentally in six horses, by introducing *Penicillium* culture into the guttural pouch, either alone or after preliminary irritation by alcohol or phenol. —J. E.

Burkholder, P. R., & McVeigh, I. (1942). **Synthesis of Vitamins by Intestinal Bacteria.**—*Proc. nat. Acad. Sci.* **28**. 285–289. **2092**

Pure cultures of various intestinal bacteria were grown in a liquid medium at 36°C. for 48 hours; similar cultures were kept at 2°C. for the same period, as controls. All cultures were then acidified, and autoclaved to hydrolyse the cells. Vitamin assays were made for biotin, riboflavin, thiamine, and nicotinic acid. Considerable quantities of the latter three vitamins, and small quantities of biotin had accumulated in cultures of *Bacterium coli*, *Bact. aerogenes*, *Alcaligenes faecalis*, and *Bacillus vulgatus*. *Proteus vulgaris* was unable to grow without nicotinic acid, but grew and synthesized the other three vitamins when nicotinic acid was supplied. Similarly *B. mesentericus* required biotin for growth and for synthesis of the other three vitamins.

Further tests with *Bact. aerogenes* showed that the rate of vitamin synthesis was highest in the first few hours of growth, and that the amounts of vitamins leached out into the medium increased with the age of the culture.—D. G. Gilmour.

See also absts. **2254** (mastitis), **2257** (cocci), **2252** (staphylococcus), **2251** (pneumococci), **2175**, **2259**, **2281**, **2291**, **2295** (TB.), **2176** (TB. and brucella), **2261**, **2282** (brucella), **2162**, **2286** (salmonella), **2262** (clostridia), **2280** (bacteria in cheese), **2292-2294** (culture methods), **2290** (measurement of bacterial growth), **2279** (action of sound waves on bacteria).

DISEASES CAUSED BY PROTOZOAN PARASITES

Kofoid, C. A. (1942). **The Social Aspects of the Epidemiology of Amoebic Dysentery.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5**. 7–10. **2093**

It is pointed out that the epidemiology of human amoebic dysentery is not dependent on the dysenteric phases of the infection but rather on the chronic non-dysenteric ones, as they are the main sources of the cysts upon which the parasite depends for transfer to new hosts. The length of life of the cysts is not known, but they will remain viable on dried slides, and after passage through the digestive tract of flies. Dogs, cats, pigs, rabbits, and g. pigs have been experimentally infected, but there is no body of evidence of their agency as reservoirs of human infection.—U. F. R.

Torres, C. M. (1942). Alterações dos capilares do coração, na infecção experimental pelo *Schizotrypanum cruzi*. [**Changes in the Cardiac Capillaries in an Animal Infected Experimentally with** *Trypanosoma cruzi*].—*An. Acad. brasil. Cienc.* **14**. 1–5. **2094**

T. inoculated a month-old dog with *T. cruzi* and carried out an autopsy 13 days later. Only a few of the cardiac muscle fibres showed trypanosomes. In some parts the beginning of an acute, diffuse, interstitial myocarditis could be observed. Cellular infiltration appears to begin near the cardiac capillaries and consists largely of cells similar to blood monocytes. The early lesions of the capillaries consist of tumefaction of the endothelium, dilatation, and stasis of leucocytes. In the later stages the capillary walls are collapsed and the lumen greatly diminished and practically devoid of blood.—Miller Watson.

Levine, P. P. (1942). **A New Coccidium Pathogenic for Chickens,** *Eimeria brunetti* **n. sp. (Protozoa: Eimeriidae).**—*Cornell Vet.* **32**. 430–439. **2095**

A type of coccidiosis was observed in chickens, in which the lesions differed from those associated with any of the seven species already known in chickens; pure line infections were established. The oocysts are

oval in shape and average 26·8μ × 21·7μ; they can be distinguished from those of *E. maxima* which they most closely resemble, by the absence of the thickening of the inner surface at the narrow end of the unsporulated oocyst. *E. brunetti* sporulates in 24–48 hours in culture at 30°C. Oocysts and developing stages are found in the lower half of the small intestine, rectum, cloaca, and caeca and, in severe cases, in the upper half of the small intestine. Light infections produce no gross lesions, but heavier ones cause a catarrhal enteritis with a blood-tinged mucous exudate. Short, red, transverse streaks often occur in the mucosa of the lower intestine and rectum. Coagulation necrosis and sloughing of the mucosa accompany severe infections. A dry membrane lining the intestinal tract and representing the necrotic mucosa is frequently found. Lesions may occur in patches or may be continuous. In the caeca the dilated portions are usually without lesions, but the constricted tubular portions are frequently dilated and plugged with caseous cores. Cross-immunity tests have been made which support the view that the species is new. There is a periodicity in oocyst discharge which reaches its peak between 9.00 a.m. and 3.00 p.m. Sulphaguanidine fed in the proportion of 0·5% of the ration prevents infection. L. considers it likely that infections with this species may be quite common and may hitherto have been attributed to *E. maxima* or even *E. tenella*.—C. Horton Smith.

Yakimov, V. L., & Machul'skiĭ, S. N. (1940). Koktsidii zhivotnykh zoologicheskovo sada v Tashkente. **[Coccidia from Animals in the Zoological Garden, Tashkent].**—*Parazitol. Sborn., Moscow.* **8.** 236–248. [French summary]. **2096**

The authors consider the examination of animals in zoological gardens to be a reliable means of determining the species of coccidia to be found in the same animals in the wild state. They examined 56 species of mammals and 44 species of birds, as well as reptiles and amphibia. Among the species found were :– *Isospora felis* from the lion ; *Eimeria arloingi*, *E. faurei*, and *E. arkhari* n.sp. from *Ovis polii polii* and *O. p. severzowi* ; *E. ninae-kohl-yakimovi* and *E. galouzoi* from sheep and goats ; *E. langeroni* n.sp. from pheasants, and *E. tenella* from various breeds of fowls. The morphology, measurements, and differential characters of the new species are given in detail. There are useful diagrams and a good reference list.—A. Moldawsky.

Russell, P. F., Mulligan, H. W., & Mohan, B. N. (1942). **Active Immunization of Fowls against Sporozoites but not Trophozoites of *Plasmodium gallinaceum* by Injections of Homologous Sporozoites.**—*J. Malar. Inst. India.* **4.** 311–319. **2097**

Repeated injections of large numbers of inactivated sporozoites of *P. gallinaceum* were found to cause a considerable rise in the agglutination titre of the serum against homologous sporozoites. Sporozoites were inactivated by grinding and complete drying of the thoraces of infected mosquitoes. A suspension of this material was then injected intravenously. This method of inactivation is described as quicker and easier than the one previously followed by the authors, which involved the dissection of salivary glands and their exposure for 30 min. to ultra-violet radiation. Vaccinated birds were, however, susceptible to mosquito-borne infection with the homologous strain of *P. gallinaceum*, but birds having an agglutination titre of 1 : 32,000 or higher developed a mild infection with a mortality rate of 7·7%, contrasted with 51·4% in normal fowls or those having an agglin. titre of 1 : 16,384 or less. Sporozoite vaccination conferred no protection against intravenous injection of homologous trophozoites.

—H. N. Ray.

Vezzoso, B. (1941). L'immunità passiva nell'infezione da *Plasmodium gallinaceum*. Nota seconda. **[Passive Immunity in *P. gallinaceum* Infection. II].**—*Riv. Malariol.* Sez. I. **20.** 238–250. [English summary]. [For previous article, see *V. B.* **11.** 506]. **2098**

In previous experiments, V. found that serum from fowls which had recovered some months before from *P. gallinaceum* infection did not confer immunity.

As a result of a new series of experiments he concludes that serum from birds more recently recovered from the infection does possess immunizing properties at low titre.—Miller Watson.

Bishop, A. (1943). **Variation in Gametocyte Production in a Strain of *Plasmodium relictum* in Canaries.**—*Parasitology.* **35.** 82–87. **2099**

It had been brought to B.'s notice that there was a tendency for the number of gametocytes formed during the acute attack to be greater in birds inoculated in summer than in winter. The object of the present investigation was to establish or refute this observation in relation to *P. relictum*. Differential counts were made of asexual stages and gametocytes in birds inoculated at all seasons of the year. Another series of birds infected over a long period by the inoculation of blood from acutely infected birds was examined to determine whether there was a reduction in gametocyte production, as other writers had found in *P. cathemerium*. B. found that there was no reduction in the number of gametocytes produced in a strain of *P. relictum* in canaries when passaged for two years by blood inoculation from acutely infected birds. She discovered a seasonal fluctuation in the production of gametocytes, the peak being reached during the period April-August. The number of gametocytes found in birds inoculated from the same source showed great variation and bore no relation to the intensity of the infection or age of the host.—C. H. S.

McLendon, S. B. (1943). **Experimental Attempts to Infect Man with Avian Malaria.**—*Amer. J. Hyg.* **37.** 19–20. **2100**

Four experiments were carried out in an attempt to infect human subjects with the pigeon strain of *Plasmodium relictum*, which was inoculated intravenously into seven male negroes who were not known to have been infected at any time. In three experiments, blood was drawn from heavily infected birds into equal amounts of sodium citrate and injections were made an hour after the blood was drawn. In the fourth experiment, a greater number of parasites was used : 10 ml. of heart blood was drawn from the bird into sodium citrate solution, the whole was centrifuged, and finally the cells were suspended in 6 ml. of normal saline. This suspension, which carried about nine billion parasites, was injected into a man. No reaction followed and no infection was traced in smears made every other day for a period of two months. Half-an-hour after the injection, blood was drawn from the patient and injected into an uninfected pigeon, which became infected eight days later and died after 17 days. This test was repeated with positive results 4½ hours after injection had been made.—C. Horton Smith.

See also absts. **2263**, **2313** (trypanosomiasis).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Rutherford, R. S. G. (1942). **Foot and Mouth Disease and the coming Winter.**—*Fm Econ.* **4.** 36–39. **2101**

Considerable publicity has been given to the view that recent outbreaks of F. & M. disease in the United Kingdom have been due to the feeding of unboiled

swill. R. claims that this cannot be the whole explanation because out of 60 " initial " outbreaks during the last three years, only three have been in pigs and five in pigs and cattle together.—JOHN FRANCIS.

*LARSEN, L. H., & BENDIXEN, H. C. (1940). Forsøg, udført Vinteren 1938–39 med Midler til Mildnelse af Mund- og Klovesygeangreb hos Malkekøer. [**Experiments Performed in the Winter of 1938-39 on Methods of Alleviating Foot and Mouth Disease in Milch Cows**].—*Beretn. Forsøgslab. Kbh., 1940.* p. 90. [Abst. from abst. in *Z. InfektKr. Haustiere.* **58.** 118]. **2102**

Observations were made on the severity of F. & M. disease in four groups of cows. Cows of group I received antiserum and were placed on half rations, group II received antiserum and full rations, group III no antiserum and full rations, and group IV no antiserum and half rations. This discriminative feeding was imposed early enough to take effect during the incubation period, but the time point of serum treatment is not stated.

The severity of the disease when it attacked the cows was least in group I and progressively worse in groups II–IV.—J. E.

FLÜCKIGER, G. (1943). In welchem Ausmass sind von der Maul- und Klauenseuche genesene Tiere Ansteckungsträger ? [**To What Extent are Animals Recovered from Foot and Mouth Disease Carriers of Infection ?**]—*Z. InfektKr. Haustiere.* **59.** 220–224. **2103**

F. reiterates his belief that F. & M. disease is sometimes conveyed by virus carriers, this having been criticized by FORSSMAN & MAGNUSSON [*V. B.* **13.** 51]. Experiences of Swiss veterinarians are peculiarly important in consideration of the problem, in view of the traditional move of lowland cattle to alpine pasture during summer. Many cases of F. & M. disease in alpine cattle in contact with previously infected lowland cattle have been observed, in which any other source of infection has been hardly possible.

F. also refers to other reports from various countries which support his belief.—J. E.

BORTOLOTTI, M. (1942). La disinfezione nei casi di afta epizootica. [**Disinfection in Foot and Mouth Disease**].—*Nuova Vet.* **20.** 192–195. **2104**

This is a review of methods of disinfection in F. & M. disease, particularly with caustic soda. No new knowledge is contributed.—MILLER WATSON.

I. *BOECKER, E., & JAHN, G. (1941). Bericht über die Tätigkeit der Wutschutzabteilung des Preussischen Instituts für Infektionskrankheiten Robert Koch in Berlin in den Jahren 1937 und 1938. [**Report of the Rabies Vaccination Department of the Robert Koch Institute, Berlin, 1937 & 1938**].—*Veröff. Volksgesdh. dienst.* **55.** No. 3. pp. 45. Berlin : Richard Schoetz. [RM. 1.60]. **2105**

II. *ZIMMERMANN, W., & HEYMANN, G. (1941). Die Tätigkeit der Wutschutzabteilung am Hygienischen Institut der Universität Breslau in der Zeit vom. 1. Januar bis 31. Dezember 1939. [**Report of the Rabies Vaccination Department of the Hygiene Institute of Breslau University, 1939**].—*Ibid.* pp. 45. **2106**

III. *PIRINGER, W. (1941). Bericht der Abteilung für Wutschutzimpfung der Staatlichen Impfanstalt und des Staatlichen Serum-Prüfungsinstituts in Wien für die Zeit vom 1. Januar 1939 bis 31. Dezember 1939. [**Report of the Rabies Vaccination Department of the State Vaccine Institute and the State Serum-Testing Institute, Vienna, 1939**].—*Ibid.* pp. 45. **2107**

[Absts. from absts. in *Jber. Vet.-Med.* **69.** 303].

I. In 1937 the Högyes-Phillips method of anti-rabies vaccination was replaced by Semple's method. During that year a total of 79 persons received 11–14 injections each of a vaccine consisting of a glycerinated rabbit brain emulsion. Of the vaccinated persons none died of rabies, but one did develop an illness traceable to the effects of the vaccination. In 1938 all the 152 vaccinated persons remained well. In the same year the brains of 66 animals were examined for rabies. A positive diagnosis was made in the case of 19 dogs and three bovines.

II. In the Breslau institute, 179 persons were vaccinated during 1938–39. Here too no deaths occurred from rabies, but two children developed tetanic spasms probably referable to vaccination two months after the final vaccination had been given. Out of 52 animal brains submitted for examination, rabies was diagnosed in 21 by the finding of Negri bodies and in five by animal inoculation.

III. In Vienna 261 persons were vaccinated according to Semple's method. None of them died nor was there a single case of " vaccination myelitis " or any other illness attributable to vaccination.—M. L.

HOAGLAND, C. L., WARD, S. M., SMADEL, J. E., & RIVERS, T. M. (1942). **Constituents of Elementary Bodies of Vaccinia. VI. Studies on the Nature of the Enzymes Associated with the Purified Virus.**—*J. exp. Med.* **76.** 163–173. [For previous parts, see *V. B.* **12.** 152]. **2108**

E.b. of vaccinia obtained by differential centrifugation have been subjected to chemical analysis. MACFARLANE & SALAMAN [*V. B.* **9.** 316.] have reported the presence of catalase and phosphatase, but the absence of dehydrogenase activity, and assume that the former enzymes are probably an integral part of the virus bodies. The present authors, using a modified Thunberg technique, devised by QUASTEL & WHEATLEY [(1938). *Biochem. J.* **32.** 936.], failed to detect malate, succinate, pyruvate, and lactate dehydrogenases.

Tests for phosphatase, catalase, and lipase activity were positive, but the view is expressed that although these enzymes may have been derived from the e.b. themselves, they may also have been absorbed from the host tissues. It was found that the addition of these substrates to purified e.b. which were subsequently well washed, resulted in a significant increase in the enzyme content of the particles. Some degree of specificity in this absorption was recognized since the virus particles failed to absorb urease.—R. E. GLOVER.

PRINCI, S. (1942). L'azione della vitamina A sul *virus* influenzale. I. Ricerche sperimentali *in vivo*. II. Ricerche sperimentali *in vitro*. [**Action of Vitamin A on Influenza Virus. I.** *In vivo.* **II.** *In vitro*].—*Boll. Soc. ital. Biol. sper.* **17.** 430–431 & 431–432. **2109**

It is claimed that the survival time of mice infected with human influenza virus was prolonged (from an average of 70 to 90 hours) in mice given vitamin A in milk, and secondly that virus mixed for 1–3 hours with vitamin A was reduced in virulence as judged by survival time of infected mice (73·5 to 81 hours).—J. E.

HIRST, G. K. (1942). **Adsorption of Influenza Hemagglutinins and Virus by Red Blood Cells.**—*J. exp. Med.* **76.** 195–209. **2110**

It has been found [HIRST. (1941). *Science.* **94.** 22.], that a high percentage of the infective agent is removed from influenza virus suspensions when washed chick cells are added and centrifuged out at low speed. It is now shown that with PR8 influenza virus the maximum adsorption of agglutinins took place after one hour, but that 25% reappeared in solution after six

hours. With the Lee strain (B virus), adsorption and elution were more rapid and more complete. The speed of adsorption and elution varied with the temperature (temperatures of 4°C., 27°C., and 37°C. were investigated). Red blood cells which had been precipitated by the virus retained their full capacity to agglutinate again in the presence of virus for at least 18 hours when adsorption was carried out at low temperatures. At high temperatures, however, this capacity was reduced, while r.b.c. exposed for long periods lost their agglutinability completely. On the other hand, the activity of the agglutinin in virus suspensions was unaffected by the process of adsorption and elution.

Influenza haemagglutinins were unaffected by heating to 50°C. for one hour, but were materially reduced at 60°C. Formalin concentrations of 0·1 and 0·5% appreciably retarded the reaction. A comparison of the agglutination titre of samples removed from the viruses-r.b.c. complex at various stages with the mortality titre in mice suggested that the infective and agglutinative activities were closely associated.

H. draws attention to the analogy of this reaction with the interplay of enzymes and substrates. The first stage in enzyme action is a combination with substrate. Then the substrate is chemically changed, whereupon the enzyme and altered substrate dissociate and the former is free to absorb more of the latter. In this analogy agglutinin corresponds to the enzyme, which is not used up, while the substrate corresponds to the substance on the r.b.c. which is destroyed during the process of agglutination rendering the cell incapable of further adsorption.—R. E. GLOVER.

EBERBECK. (1942). Statistischer Bericht über die im Jahre 1939 im Heeres-Veterinäruntersuchungsamt Berlin ausgeführten pathologisch-anatomischen und histologischen Untersuchungen, insbesondere (Teil I) weitere kasuistische Belege für die Pathologie des ansteckenden Katarrhs der Luftwege des Pferdes nebst Folgeerscheinungen. **[Statistical Report for 1939 on Pathological Work at the Army Veterinary Investigation Office at Berlin, Especially on Equine Infectious Respiratory Catarrh].**—*Arch. wiss. prakt. Tierheilk.* **77.** 283–290. **2111**

This paper consists entirely of protocols concerning routine diagnostic work on horse carcasses and parts thereof. A descriptive and summarizing article appeared elsewhere [see *V. B.* **11.** 39].—J. E.

—. (1943). Schweiz. Bundesratsbeschluss über vorläufige Massnahmen zur Bekämpfung der ansteckenden Blutarmut der Einhufer. **[Switzerland: Federal Decision on Preliminary Control Measures for Equine Infectious Anaemia].**—*Reichsgesundheitsblatt.* **18.** 241. **2112**

E.I.A. is hereby made notifiable in Switzerland. Notification is made by veterinary surgeons to the canton veterinarian, who has to confirm the diagnosis and notify the Federal veterinary office. Affected horses must be isolated. The Federal veterinary office is empowered to institute further control measures.—J. E.

GALLO, P., & VOGELSANG, E. G. (1940). Resumen de los conocimientos actuales acerca de la encefalomielitis equina en Venezuela. **[Known Facts about Equine Encephalomyelitis in Venezuela].**—*Rev. Med. vet. parasit., Caracas.* **2.** Nos. 1/2. 143–148. **2113**

The first recognized outbreak of E.E. in Venezuela was in 1938, but there were probably earlier epidemics. The disease has occurred in many parts of the country.

Three clinical forms are recognized, *viz*, the hyperacute, which begins with great excitement and ends in exhaustion, the "sleepy" form, and a type in which motor ataxia is the predominant symptom.

Intravenous injections of turpentine and urotropine are stated to have proved useful curative measures [a frequent statement with regard to urotropine which lacks proof and is probably based on an erroneous conception of the pharmacology of the drug (see also HEISEKE, below)—Ed.]. Immunization with chick-embryo vaccine is satisfactory. Vaccines prepared from Eastern and Western United States strains have proved useless as a protection against the Venezuelan virus.—M. W.

*HEISEKE, E. (1939). Beiträge zur Frühdiagnose und Therapie der seuchenhaften "Gehirn-Rückenmarksentzündung (Bornasche Krankheit)" des Pferdes. **[Early Diagnosis and Therapy of Borna Disease].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Berl. Münch. tierärztl. Wschr.* March 7th. 115]. **2114**

A recital of the clinical symptoms denoting Borna disease. In the early stage hexamethylenetetramine given intravenously and perorally is recommended. [See FILKOV (*V. B.* **12.** 471.), for note on the action of hexamethylenetetramine. The use of this drug for the treatment of virus diseases of this type in animals is quite commonly advocated. There does not appear to be any experimental evidence of its value for the purpose. Its use for the treatment of encephalitis lethargica in human beings has been equally commonly advised. In the very full report on the literature of the diseases of that type issued by the Matheson Commission in the U.S.A. (see *V. B.* **12.** 581.), it is stated that there is no evidence that hexamethylenetetramine (urotropine) is of any value.—Ed.]

HUANG, C. H. (1942). **Titration and Neutralization of the Western Strain of Equine Encephalomyelitis Virus in Tissue Culture.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 396–398. **2115**

The advantages of the *in vitro* tissue culture (chick-embryo tissue) method of virus titration and neutralization are discussed.

Various dilutions of Western E.E. virus were inoculated into such cultures and incubated at 37°C. Microscopic examination after prolonged incubation revealed that the virus had had an inhibitory effect upon the cells of the culture; the presence of virus was proved by the intracerebral inoculation of mice. The viral titre was shown to be higher in the above method than it was in a parallel *in vivo* experiment in mice. Virus neutralization by antiserum in tissue culture was demonstrated by a similar method to the above.—J. C. BUXTON.

OLITSKY, P. K., SCHLESINGER, R. W., & MORGAN, I. M. (1943). **Induced Resistance of the Central Nervous System to Experimental Infection with Equine Encephalomyelitis Virus. II. Serotherapy in Western Virus Infection.**—*J. exp. Med.* **77.** 359–374. [For part I, see *V. B.* **13.** 127]. **2116**

Previous workers [ZICHIS & SHAUGHNESSY—*V. B.* **11.** 683.] had reported the successful treatment of experimental infection of g. pigs with Western E.E. virus by means of large quantities of hyperimmune rabbit serum administered after the onset of symptoms, and this paper records experiments designed to ascertain whether the effectiveness of antiserum in the prevention and treatment of the experimental disease depended on the quantities administered, and secondly whether serotherapy could arrest the infection after the appearance of symptoms.

Two separate strains of Western E.E. virus and specific hyperimmune rabbit serum were used upon mice and g. pigs, and under none of the experimental conditions described was treatment effective if begun after the onset of encephalitis. The injection of virus alone led to the establishment of an active immunity in

untreated g. pigs which survived, and it is stated that antiserum blocked the antigenicity of virus in serum-treated animals.—J. C. Buxton.

Hammon, W. McD. (1943). **Encephalitis. Eastern and Western Equine and St Louis types, as observed in 1941 in Washington, Arizona, New Mexico and Texas.**—*J. Amer. med. Ass.* **121.** 560–564. **2117**

A general review of the problem of encephalitis in human beings and horses in the western states of the U.S.A., together with a few fresh records.

In 1941, serum-neutralization tests were carried out with the serum of 61 human cases against St. Louis, Western E.E., and Eastern E.E. viruses. Forty-four were positive for St. Louis, 32 for Western E.E. and one for Eastern E.E. virus. These cases occurred in Washington, Arizona, New Mexico, and Texas, and 24 were simultaneously positive for St. Louis and Western E.E. viruses. As it is now well known that healthy persons and animals may possess antibodies to these viruses, a diagnosis cannot be made from a single serum-neutralization test: two tests before and after an attack of encephalitis are necessary [this presumably being considered a possible measure with regard to human beings in affected areas].

The presence of a fourth virus causing encephalitis in man is postulated, because cases have occurred possessing no antibodies against St. Louis or E.E. viruses.

For epidemiological reasons, H. considers that an unidentified host reservoir of these viruses occurs and that the typical summer cases in horse and man are arthropod-transmitted, chiefly by mosquitoes.—J. E.

Roberts, E. C., & Jones, L. R. (1942). **Encephalitis Virus " Antibody " in Sera of Experimentally Infected Animals by Agglutination of Virus-Coated CeHs.**—*Proc. Soc. exp. Biol., N.Y.* **49.** 52–54. **2118**

The " bacterial agglutination " (B.A.) method [see *V. B.* **12.** 416.] was used to detect antibodies in the sera of 14 hamsters and two monkeys experimentally infected with the virus of St. Louis encephalitis. The sera from all the infected animals gave positive results, in some cases as early as the second day after inoculation, while the serum from the normal hamsters, and from the monkeys prior to inoculation, gave negative results. In the monkeys, the agglutinating factor appeared in the serum several days before the onset of symptoms.
—J. P. Gardner.

Matthews, H. T., & Doyle, T. M. (1943). **Crystal Violet Vaccine against Swine Fever. A Field Trial.**—*J. comp. Path.* **53.** 121–129. **2119**

This paper is the account of a trial carried out to test the efficacy of crystal-violet vaccine under field conditions.

Store pigs were purchased in the open market, vaccinated by the subcutaneous injection of 10 ml. of the vaccine, held under observation pending the establishment of immunity, and then dispatched to premises upon which there was an outbreak of swine fever. In addition, one or two pigs in each litter were used as unvaccinated controls and artificially inoculated with virus. Pigs were placed in as intimate contact as could be arranged on the infected premises, usually at the height of infection, and were observed at least once weekly over a period of not less than 28 days. Out of 36 vaccinated pigs severely exposed in 17 naturally occurring outbreaks of S.F., one died of the disease, one became ill but recovered, three showed reactions of a minor character, and 31 resisted infection. Crystal-violet vaccine appears to have afforded a high degree of protection in this series of cases.—J. C. Buxton.

I. *Hupbauer, A., & Zarnić, I. (1942). **[Porcine Encephalomyelitis].**—*Vet. Vjesnik.* pp. 3–31. [German summary]. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **142.** 513]. **2120**

II. *Hupbauer, A., & Zarnic. (1942). **[Is the Virus of Infantile Paralysis Identical with that of Porcine Encephalomyelitis ?]**—*Vet. Arhiv.* No. 9. [Abst. from abst. in *Svensk VetTidskr.* **48.** 26]. **2121**

I. The incidence of the disease in Yugoslavia and its recognition in Crotia are discussed. For preservation of the virus, 50% glycerin was found to be suitable. Susceptible piglets could not be infected by contact, by feeding, by introduction of virus by stomach tube, or by subcutaneous injection. The most successful infection routes with a 10–20% brain or spinal cord emulsion were the nasal and subdural. Since an infection rate of 85% was obtained with either route, the nasal one was adopted, for ease of procedure. Virus could not be demonstrated in the faeces of affected pigs. Of five piglets treated with urine of affected animals, three were much more resistant than untreated controls to a later infection, which seems to indicate that virus is excreted in the urine. Virus is occasionally present in the blood. The mucous membrane of the upper part of the nasal cavity must be considered the chief portal of infection. Increase of the virus on the nasal mucous membrane may enable infective material to be expelled in coughing or sneezing, and spread of the disease may result from droplet infection or contamination of food, etc. The role of the pharynx in infection is not known, but painting of its mucous membrane with virus did not produce infection. Prontosil treatment proved useless, as did immunization with a formolized brain and spinal cord vaccine.

II. The authors administered pernasally and subdurally to six pigs material from cases of infantile paralysis (urine, saliva, and brain plus spinal cord) without effect. Two of the pigs were killed and examined, but no trace of injury could be found, even on histological examination. The remaining pigs were infected with porcine encephalomyelitis virus and became affected in the usual way.

It is concluded that pigs are not susceptible to poliomyelitis and that there is no connexion between it and P.E.

Carlström, B. (1942). Om valpsjuka hos mink. **[Distemper in Mink].**—*Skand. VetTidskr.* **32.** 610–618. [English summary]. **2122**

C. describes a disease which caused great loss in a mink farm in Sweden. It occurred among new stock provided from a disease-free farm. The first symptom was a rough coat, along with loss of appetite, and it was noticed that the sleeping lair was in disorder. Later symptoms included incontinence of urine, followed by ataxia, cramps, especially of the jaw muscles, and difficulty in eating. At this stage there was rapid wasting and death soon took place 6-14 days after the beginning of illness.

As the condition was at first thought to be a deficiency disease, various vitamin and other preparations were used, but without success. Dosage with German dog distemper immune serum did, however, delay sickness and death. At this point, 130 young mink died suddenly during their first month of life, but the remainder were saved by mass serum treatment. Thereafter the disease disappeared.

The result of antiserum therapy suggested that infection was due to dog distemper virus, though there was no history of contact with other infected animals and some attempts to recover and transmit an infective agent to healthy mink failed. It was, however, noticed that some blue foxes on the same farm passed through a mild catarrhal infection whilst the mink were ill.

C. discusses various reports of distemper in carnivores and concludes that the disease observed was virus distemper, which has not previously been diagnosed in Sweden in mink.—J. E.

FRANCIS, T., Jr., & MAGILL, T. P. (1938). **An Unidentified Virus Producing Acute Meningitis and Pneumonitis in Experimental Animals.**—*J. exp. Med.* **68.** 147–160. 2123

In 1934 and 1936, a filtrable virus, distinct from influenza virus, was isolated from ferrets inoculated with throat washings from suspected epidemic influenza cases among human beings; it was not possible to determine whether the virus was of human or of ferret origin. The virus was pathogenic for ferrets, monkeys, and mice, and partly so for g. pigs and rabbits; intranasal infection in ferrets and mice produced an extensive fatal pneumonia, while mice inoculated intracerebrally developed a fatal choriomeningitis, and monkeys similarly inoculated developed a non-fatal lymphocytic choriomeningitis. The virus was named the "virus of acute meningopneumonitis". Although possessing many features in common with the virus of lymphocytic choriomeningitis and the virus of lymphogranuloma inguinale, the new virus did not appear to be immunologically related to these two viruses.—E. COTCHIN.

BECK, M. D., & EATON, M. D. (1942). **Identification of Two Strains of Virus Isolated from Cases of Atypical Pneumonia.**—*J. infect. Dis.* **71.** 97–101. 2124

Two laboratory workers became infected with a non-fatal psittacosis-like condition when working with this group of viruses; in both instances a strain was isolated which seemed to be immunologically identical with a psittacosis-like virus isolated from man by EATON *et al.* [*V. B.* **11.** 769.], but was slightly different from true psittacosis and even more remote from the meningopneumonitis virus isolated by FRANCIS & MAGILL [see preceding abst.].

It is suggested that there is a group relationship between the viruses of human pneumonitis, meningopneumonitis of mice psittacosis, and lymphogranuloma venereum. All these strains have elementary bodies: all are infectious for mice by the intracerebral and intranasal routes, but only psittacosis virus is highly virulent by the intraperitoneal route.—R. E. GLOVER.

RACKER, E., & KABAT, H. (1942). **The Metabolism of the Central Nervous System in Experimental Poliomyelitis.**—*J. exp. Med.* **76.** 579–585. 2125

Swiss albino mice 4–6 weeks old were inoculated intracerebrally with 0·03 ml. of a 10% suspension of brain tissue from mice infected with the Lansing strain of poliomyelitis. When definite paralysis supervened, but before the animal became moribund, the brain was removed and its respiratory activity measured manometrically. The results indicated that, as compared with normal mouse brain, there was a 5–50% decrease in anaerobic glycolysis, without any significant change in oxygen utilization, and that sodium fluoride produced a greater inhibition of anaerobic glycolysis in normal than in poliomyelitis brain. In the absence of added substrate, dehydrogenase activity was also higher.

Some respiratory studies were also carried out with the brain tissue of normal dogs and cats. The results suggest that, at a certain stage of the infection, the nerve cells may be reversibly injured but not destroyed by the virus.—ALASTAIR N. WORDEN.

PLOTZ, H. (1943). **Complement Fixation in Rickettsial Diseases.**—*Science.* **97.** 20–21. 2126

A note on the application of the complement-fixation test for the diagnosis of endemic typhus, "Q" fever, and Rocky Mountain spotted fever in human beings, and on the degree of specificity obtained when culture antigens are used with sera from heterologous and homologous infections.—U. F. RICHARDSON.

See also absts. **2264**, **2314** (F. & M. disease), **2265** (avian laryngotracheitis), **2160** (Shope papilloma), **2169** (virus of fowl tumours).

IMMUNITY

EGGERTH, A. H. (1942). **The Effect of Ninhydrin Upon Rabbit-Serum-Protein and Antibodies.**—*J. Immunol.* **45.** 303–314. 2127

When similar experimental methods were used to those previously described [see *V. B.* **12.** 495.], the action of ninhydrin on the serum antibodies of rabbits immunized against type I pneumococci and the typhoid bacillus was found to differ from that on similar horse-serum antibodies. In rabbit antisera, ninhydrinization increased the titre of typhoid H-agglutinins two- to four-fold, and left the titre of typhoid and pneumococcal antibodies unchanged. [With horse antisera, the activity of typhoid H-agglutinins was unaltered, while pneumococcal and typhoid O-antibodies were partially inactivated. (See *V.B.* **12.** 495.)] Several hypotheses in explanation of the increased H-agglutinin titre, apparently the first instance in which antibody activity has been increased by chemical alteration of antibody protein, are suggested and discussed.—J. LOCHIEL MCGIRR.

*AOKI, Y., & KANEMITSU, J. (1940). Zur Bedeutung des Medium-pH bei dem Übergang antigener, das Verwandtschaftsverhältnis bekundender Serumsubstanzen. **[Effect of Modification of pH on Antigenic Character of Serum Proteins].**—*Jap. J. med. Sci.* **2.** Part VI. 43–57. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 112]. 2128

Cattle, horse, goat, or pig serum was mixed with buffer solutions of pH 2–8. The precipitates and residues were examined by rabbit antisera specific for each. It was concluded that two antigens were present, one species-specific, not precipitated by the buffer, and of the nature of serum globulin and albumin, and the other, which was responsible for the heterologous reactions, of the nature of a nucleoprotein.—J. G. CARR.

See also absts. **2204** (vitamins and immunological reactions), **2060**, **2061** (allergy and immunity in TB.), **2097**, **2098** (immunization against avian malaria), **2119** (against swine fever), **2126** (complement fixation in rickettsiasis), **2129**, **2142**, **2146** (immunological diagnosis of parasitism), **2148**, **2149** (hookworm immunity).

PARASITES IN RELATION TO DISEASE [GENERAL]

PIRES, A. (1939). Alergia en el parasitismo—contribución a su estudio. **[Allergic Diagnosis of Parasitism].**—*An. Fac. Med. vet., Univ. La Plata.* **2.** 65–128. 2129

P. carried out a large number of experiments in the diagnosis of internal parasitism by the use of intradermal injection of a filtered, sterile extract of the parasite concerned—adult or larva. The reaction produced in positive cases was a local erythema and oedema.

Antigen prepared from adult *Fasciola hepatica* produced a reaction in infested animals and was apparently specific. P. was unable to prove the specificity of the reaction in equine strongylosis. Diagnosis of *Gastrophilus nasalis* infestation with homologous material was apparently specific.

Material prepared from *Ascaris lumbricoides* or *Macracanthorhynchus hirudinaceus* did not prove entirely specific, although in pigs with mixed infestations given two intradermal injections, there was usually a greater reaction to the injection corresponding to the parasite present in greater number. Material from female *A. lumbricoides* proved more effective than that prepared from males.

After repeated injection of a given diagnostic material, the animals became accustomed to it and the reactions diminished. Fresh material produced more pronounced and longer lasting reactions than material which had been kept in stock, although two-year-old material retained some activity.—MILLER WATSON.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

WERNECK, F. L. (1941). Os malófagos do boi e do cavalo. **[Mallophaga of Cattle and Horses].**—*Rev. brasil. Biol.* **1.** 195–199. [French summary]. **2130**

W. compared a specimen of the male of *Bovicola equi* from a horse with lice found on a Barbary sheep, *Ammotragus* [*Ovis*] *lervia*, in the Zoological Society's Gardens, London, England. He concluded that the specimens from the Barbary sheep represented a different species, possibly new.

Descriptions and drawings are given of the males of *B. equi* and *B. bovis*.—MILLER WATSON.

RAO, B. V. C. (1942). **Ulcerative Conjunctivitis Caused by Moth Flies.**—*Indian vet. J.* **19.** 30–31. **2131**

The form of conjunctivitis described in this paper affected cattle and was characterized by the occurrence of lachrymation and sometimes of corneal ulcers. The disease is attributed to infestation of the eyes by " moth flies " [Lepidoptera—species not mentioned], which had a sticky white powder at the postero-ventral part of the abdomen, suspected of being the cause of the irritation. The eyes were successfully treated by irrigation with 1 : 2,000 mercury perchloride.—S. K. SEN.

KISSILEFF, A. (1942). **The Etiology of Summer Eczema in Dogs.**—*J. Amer. vet. med. Ass.* **101.** 108–113. **2132**

K. considers that the skin conditions associated with " summer eczema " in dogs are the result of the dog's attempts, by scratching and biting, to rid itself of fleas. He states that as long as fleas are allowed to remain, the wounded areas never completely heal, with the result that the hide in such places becomes toughened, whereas complete removal of the fleas is followed by immediate recovery.—J. B. CRAGG.

OSORNO-MESA, E. (1940). Las garrapatas de la República de Colombia. **[The Ticks of Colombia].**—*Rev. Acad. colomb. Cienc.* **4.** No. 13. 6–24. **2133**

The author lists and describes the ticks which have been identified in Colombia. These include *Argas persicus*, *A. columbarum*, *Ornithodorus talaje*, *O. rudis*, *Ixodes* spp., *Rhipicephalus sanguineus*, *Dermacentor nitens*, and *Amblyomma* spp.

Tables are given for the identification of the various species.—MILLER WATSON.

RADFORD, C. D. (1943). **Genera and Species of Parasitic Mites (Acarina).**—*Parasitology.* **35.** 58–81. **2134**

A comprehensive list of the genera and species of parasitic mites [the sarcoptid and demodicid forms are not, however, included] giving authorities, validity, and, where possible, original hosts. Some 500 species of mites and 175 hosts are listed. The bibliography includes all references containing original descriptions of the mites listed.—J. B. CRAGG.

BAKER, D. W. (1942). **Some Mites Injurious to Domestic Animals and Man Encountered Recently by New York State Veterinarians. I. Chorioptic Mange of the Horse. II. Psoroptic Mange (Scabies) of the Cow. III. Acariasis (*Liponyssus spp.*) of the Fowl, Dog and Man.**—*Cornell Vet.* **32.** 326–333. **2135**

An account of the recent occurrence of cases of the above named diseases in New York State. These cases have been put on record in order to emphasize the fact that these diseases have not been completely eradicated from the U.S.A., as some veterinary writers have stated.—J. B. CRAGG.

MARTIN, H. M., & DEUBLER, M. J. (1943). **Acariasis (*Pneumonyssus sp.*) of the Upper Respiratory Tract of the Dog.**—*Vet. Ext. Quart. Univ. Pa.* No. 89. pp. 21–27. **2136**

Three cases are described of the occurrence of mites in the nasal passages and associated structures in dogs. There were no characteristic symptoms indicative of parasitism of this region and it is thought that the condition may be more common than the number of cases would suggest. A comprehensive description is given of the mite ; this differs slightly from the original description of the species, but it is considered by the authors that the mite is *P. caninum*.—J. B. CRAGG.

See also abstr. **2313** (tsetse flies), **2068** (vectors of summer mastitis), **2076** (of shigella), **2155** (of dog heartworm), **2266-2269** (insecticides), **2288** (fly control).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

SCHWARTZ, B. (1942). **Parasitism in Relation to the Livestock Industry of the South.**—*Sci. Mon., N.Y.* **54.** 448–454. **2137**

Thirteen of the southern states of the U.S.A. are predominantly stock-raising areas and, although the domestic animal population is relatively greater in these states, the total value of the animals is proportionately less than in the rest of the U.S.A. Inadequate nutrition and parasitic infestation are two factors which are largely responsible for this, the mild, humid climate of the south being especially favourable for the development of parasites. The loss due to the stunting and unthriftiness caused by parasites is spread out and is not obvious to the stock raiser, but it is nevertheless considerable. S. advocates anthelmintic medication in the control of parasites, but stresses the importance of prophylaxis in the form of pasture hygiene and good sanitation.—T. E. GIBSON.

MUDALIAR, T. V., & MUDALIAR, S. V. (1942). **Parasites and Parasitosis of Sheep.**—*Indian J. vet. Sci.* **12.** 165–168. **2138**

A record of helminth infestation of sheep at the Hosur Cattle Farm, Madras. The species found most commonly were *Haemonchus contortus*, *Oesophagostomum columbianum*, and *Moniezia* spp.—G. D. BHALERAO.

MAHAJAN, M. R. (1942). **Liver Fluke and its Control in Hyderabad State.**—*Indian J. vet. Sci.* **12.** 133–149. **2139**

Liver-fluke disease, due to *Fasciola gigantica*, is most common in the central and southern parts of the state. Most of this area is irrigated by a system of

canals and rough reservoirs, but without adequate provision being made for drainage of surplus water. The soil is consequently water-logged and unsuitable for the growing of animal fodder, so that the livestock generally is in very poor condition. The infestation rate with *F. gigantica* is 50% in cattle, 64% in buffaloes, 25% in sheep, and 20% in goats.

To effect an all-round improvement in the condition of the livestock in the area, M. suggests (1) the growing of green fodder exclusively for animals, (2) feeding a balanced ration, (3) educating cultivators as to the manner of infection with liver fluke, (4) anthelmintic treatment, and (5) destruction of the snail intermediate hosts. Carbon tetrachloride has proved satisfactory for treatment, the dose used for cattle being 5–8 ml. and for sheep 0·5–0·7 ml. Igitol, a hexachlorethane preparation, was also tried but the cost was prohibitive.

Destruction of snails is effected by dragging ponds and water courses with specially designed wire-gauze hand nets or by treating water-logged areas with copper sulphate. 2% $CuSO_4$, when applied in the form of a spray in suitable quantities, kills the snails but not the fish. In areas overgrown with water weeds, the desired concentration of $CuSO_4$ is obtained by dissolving 1 lb. of the chemical in each 50,000–70,000 gal. water. The snails collected are mixed with quicklime and buried.

M. indicates the need of a safe and cheap drug for affected milch cows, of study of the bionomics and biological control of snails, and of a method for destroying snails' eggs.—G. D. Bhalerao.

Miyata, I. (1940). **On a New Trematode, *Opisthioglyphe canis*, Parasitic to the Small Intestine of Dogs.**—*Dobutsugaku Zassi.* **52.** 367–371. [In Japanese: English summary]. [Abst. from abst. in *Helminth. Abstr.* **9.** 138]. **2140**

M. describes and figures *O. canis* n.sp. recovered from the small intestine of a dog at Kobe, Japan.

Chen, H. T. (1942). **The Metacercaria and Adult of *Centrocestus formosanus* (Nishigori, 1924), with Notes on the Natural Infection of Rats and Cats with *C. armatus* (Tanabe, 1922).**—*J. Parasit.* **28.** 285–298. **2141**

Two worms collected from *Rattus rattus norvegicus* and one from a cat in Canton are tentatively placed in the species *C.* (= *Stamnosoma*) *armatum*, a normal parasite of wild birds.—E. S.

Skvortsov, A. A., Sokolova, L. N., & Talizin, F. F. (1941). **[Diagnosis of Cysticercosis in Cattle by an Allergic Reaction].**—*Dokl. Akad. Nauk.* **32.** 523–525. [Abst. from abst. in *Helminth. Abstr.* **10.** 116 & 117]. **2142**

The authors attempted to diagnose cysticercosis in cattle by means of a skin test, using as antigen a saline extract of hydatid heads; peptonized saline was used as a control injection. Of 72 animals tested, 22·2% reacted positively. The course of the reaction is described. In the single animal slaughtered, seven cysticerci were found.

Evranova, V. G. (1941). **[Response of the Nervous Apparatus of the Sheep to *Trichuris* Invasion].**—*Dokl. Akad. Nauk.* **33.** 502–503. [Abst. from abst. in *Helminth. Abstr.* **10.** 116 & 117]. **2143**

E. describes histopathological changes in the peripheral nervous system of sheep infested with *T. ovis*, which are stated to be irreversible. She suggests that there may be permanent disturbance of the motor nerves of the intestine.

I. Meleney, H. E. (1941). **Trichinosis in Human Diaphragms in Nashville, Tennessee.**—*Amer. J. Hyg.* Sect. D. **34.** 18–22. **2144**

II. Peres, C. E. (1942). ***Trichinella spiralis*. II. Incidence of Infection in Hogs and Rats in the New Orleans Area.**—*J. Parasit.* **28.** 223–226. **2145**

I. Of 209 diaphragms of cadavers examined in Nashville, 10% were found by digestion and compressorium examination to contain trichinae. It is urged that accurate comparisons cannot be made of the various surveys made in the U.S.A., because of differences in technique employed and material selected.

II. P. examined by the digestion technique the diaphragms of 516 garbage-fed Southern-raised pigs, samples from 792 loins of grain-fed Midwestern-raised pigs, and 50 samples of pork sausage, without finding any trichina infection. Of 467 rats examined, two were found to be infected, an incidence of 0·4%. One was from a pig farm near the city and one from a rendering plant near several pig farms, but none of 280 rats from abattoirs was infected. It is concluded that the incidence of 5–6% in human beings is maintained by an occasional infected pig, the incidence in pigs being generally low in this area as compared with other parts of the U.S.A.—E. S.

Gould, S. E. (1943). **Immunologic Reactions in Subclinical Trichinosis.**—*Amer. J. Hyg.* **37.** 1–18. **2146**

G. has attempted to assess the value of the intradermal and precipitin tests and the eosinophile count in the diagnosis of subclinical or old, unrecognized trichinosis. These tests, using one or more of three antigens, and the eosinophile count were studied amongst 3,398 hospital patients and 103 inmates of a Jewish home for the aged; the results obtained were further studied in relation to the incidence of *Trichinella spiralis* larvae in 1,231 consecutive autopsies, which included 388 of the hospital patients who had been skin-tested during life. The results showed that the chance of exposure to trichinosis increased with advancing age from 3·6% of patients in the twenties to 32·9% of patients in the eighties.

G. confirms the occurrence of repeated infections in man. Clinical history did not always reveal symptoms attributable to the infection, even in the 4% of autopsies in which 101–1,000 larvae per gramme of muscle were found. Skin sensitivity to trichina antigens was judged, on the average, to disappear within ten years and to be usually shorter than the life of the encysted larvae. The results of the immediate intradermal and precipitin tests in the aged Jewish patients, among whom the eating of pork was denied, were almost uniformly negative and indicated a high degree of specificity of the antigens tested. G. mentions that nonspecificity to trichina antigens may be due to sensitization from nonviable trichina material in ingested pork or possibly to other nonspecific factors of unknown nature.

The immediate intradermal test was found to be more sensitive and easier to read than the delayed test, but, in contrast to the findings of other workers, it was of little value in the diagnosis of old subclinical trichinosis. Precipitin reactions appeared to be related to recently acquired infections. There was no correlation between the occurrence of trichinosis, whether mild or severe, and the presence of eosinophilia: it appeared that eosinophilia was lost earlier than either the precipitin or intradermal reactions and that the eosinophile count was of no value in diagnosis of old infections.—J. N. Oldham.

Anantaraman, M. (1942). **The Life-History of *Oesophagostomum radiatum*, the Bovine Nodular Worm.**—*Indian J. vet. Sci.* **12.** 87–132. **2147**

A. investigated the development and life-history of the worm. The eggs were found to hatch 12–14

hours after being passed in the excreta, the first-stage larva lasting for 24 hours and the second for 50 hours. Infective larvae, which appeared on the 4th day, are migratory and are able to withstand long desiccation. Various tropisms and the effect of air, moisture, and temperature were studied in the case of infective larvae. The optimum temperature range for development is stated to be 75°–90°F. Fourth-stage larvae develop in the submucous nodules of the intestine in 4–5 days. They leave the nodules on the 8th day for the lumen of the intestine, and migrate to the colon where they become adults. All larval and adult stages and the technique employed are described in detail. The entire life-history of this worm is essentially similar to that of *O. columbianum*.—G. D. Bhalerao.

Watt, J. Y. C. (1943). **Active Immunization of Rats against *Nippostrongylus muris*.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 67–72. **2148**

Immunization of rats was attempted by vaccination with an antigen prepared by extracting pulverized, desiccated tissue of *N. muris* with 0·85% saline, followed by filtration through a Seitz filter. Twelve days after exposure to infection of the vaccinated and control, unvaccinated, rats, it was found that a greater proportion of the parasites had failed to complete their development and migration to the intestine in the vaccinated than in the control rats. In a second experiment, egg production and the numbers of larvae and adult worms in the lungs and intestine of vaccinated and control rats were compared 27 days after infection. The results show that the worms were inhibited but not permanently arrested in their development by their passage through the tissues of vaccinated rats. W. concludes that his vaccine sets up an immunity against *N. muris*, but states that with this vaccine " premunition " is not possible. —T. E. Gibson.

Sheldon, A. J., & Groover, M. E., Jr. (1942). **An Experimental Approach to the Problem of Acquired Immunity in Human Hookworm (*Necator americanus*) Infections.**—*Amer. J. Hyg.* **36.** 183–186. [Authors' summary copied *verbatim*]. **2149**

Microscopic evidence of the action of a serum precipitin against infective larvae of *Necator americanus* in the blood of 3 uninfected, but presumably exposed, children and of 8 of 14 children harboring very light, light and moderate infections, is presented. A precipitin reaction was obtained around and in the oral opening and around the genital and anal pores of some of the larvae placed in the sera of these children. A precipitin reaction was not obtained in the sera of 6 children with heavy and very heavy infections, or 5 children who had never been exposed to hookworm infection.

I. Sarles, M. P. (1943). **Overwinter Loss of *Haemonchus contortus* Larvae from a Sheep Pasture.**—*Proc. helminth. Soc. Wash.* **10.** 22–23. **2150**

II. Kates, K. C. (1943). **Overwinter Survival on Pasture of Preparasitic Stages of Some Nematodes Parasitic in Sheep.**—*Ibid.* 23–25. **2151**

I. A 0·7-acre pasture at Beltsville, Maryland, was grazed for the six months ending November 1940 by four lambs having light *H. contortus* infestations, a calculated total of 820,000 eggs being voided on to the pasture during this period. The pasture was left unoccupied for seven months until June 1941, when it was grazed for two weeks by two worm-free lambs, which were then kept for three weeks in cages before slaughter. These lambs did not develop *H. contortus* infestations and neither did two other lambs used to test the survival of nodular worms on another pasture, nor two control lambs kept continuously in cages. At the end of the seven-month period, direct microscopic examination of the pasture and attempted Baermann isolation of larvae from soil and faecal pellets were negative for *H. contortus* larvae. This lightly contaminated pasture had evidently been freed from stomach-worm larvae by resting over winter.

II. A quarter-acre pasture at Beltsville, Maryland, grazed by ten goats infested with gastrointestinal nematodes in the spring of 1941 and by 18 infested sheep in the fall of the year, was allowed to remain free from animals from October 15th, 1941 to May 2nd, 1942, when it was grazed for two weeks by two lambs free from parasites except for coccidia and *Strongyloides papillosus*. The lambs were then isolated in cages for four weeks before being killed and examined for gastrointestinal nematodes. P.M. examination of the animals which were in the pasture previous to October 15th, 1941, indicated that there had been a heavy deposition on the pasture of the eggs of *Haemonchus contortus*, *Trichostrongylus* spp., *Ostertagia* spp., and *Oesophagostomum columbianum*, as well as smaller numbers of the eggs of *Cooperia curticei*, *Nematodirus* spp., *Bunostomum trigonocephalum*, and *Trichuris ovis*. P.M. examination of the two test lambs showed them to be carrying only the following total number of worms :– 3 *Trichostrongylus colubriformis*, 5 *Haemonchus contortus*, 18 *Trichuris ovis*, 386 *Nematodirus* spp. (mostly *N. spathiger*) and 514 *Ostertagia* spp. Thus the winter conditions had killed off all the pre-parasitic stages of *Oesophagostomum columbianum*, *Cooperia curticei*, and *Bunostomum trigonocephalum*, and the greater number of the larvae of *Haemonchus contortus* and *Trichostrongylus* spp., whilst there was a high survival of *Ostertagia* spp., *Nematodirus* spp., and *Trichuris ovis*.—T. E. Gibson.

Mayhew, R. L. (1942). **A Preliminary Note on the Length of Life of the Stomach Worm, *Haemonchus contortus* in the Calf.**—*Proc. helminth. Soc. Wash.* **9.** 28. **2152**

A 4½-month-old worm-free calf was fed infective larvae of *H. contortus* and faecal examinations were made daily over a period of 14½ months, the animal being maintained under conditions to exclude reinfestation. From the fifth month of infestation onwards, the egg count in the faeces was at a low level and showed a gradual decrease throughout the remainder of the experiment, but eggs were never completely absent. —E. S.

Heguito, H. R. (1942). Trichoestrongilosos gastrointestinal de los lanares (lombriz del cuajo de los lanares). **[Trichostrongylosis in Sheep].**—*Bol. mens. Direcc. Ganad., Montevideo.* **26.** 42–53. **2153**

This is a general discussion on the subject, including control measures and therapeutics. H. describes his experiments with phenothiazine, but no new knowledge is contributed.—Miller Watson.

Zimmerman, H. E., Jr. (1943). **The Occurrence of Swine Ascarid Eggs in the Intestinal Contents and in the Droppings of Wild Rats.**—*Proc. helminth. Soc. Wash.* **10.** 25–26. **2154**

Eggs of the swine ascarid were recovered from the intestines of two wild rats trapped near pig pens, and when cultured in tap water they became fully embryonated in 49 days. Three days after the dosing of a test mouse with these eggs, active living larvae were recovered from its liver, an indication that some of the eggs recovered from the rat were viable. Z. considers that this may explain certain extraneous ascarid infections which had occurred at Beltsville in pigs kept under strict sanitary conditions. The finding also brings to light the possibility that wild rats may be able to disseminate ascarids under farm conditions.—T. E. G.

SUMMERS, W. A. (1943). **Experimental Studies on the Larval Development of *Dirofilaria immitis* in Certain Insects.**—*Amer. J. Hyg.* **37.** 173–178. **2155**

S. has studied the development of the larvae of *D. immitis* in ten species of mosquitoes and three species of fleas. Both laboratory-bred and wild-caught mosquitoes were fed on heartworm-infected dogs and then isolated in cages. The mosquito was only considered to be infected if the larvae had invaded and were firmly established in the Malpighian tubules of the insect. Only four of the ten species of mosquitoes used were considered to be potential transmitters of *D. immitis*. These were *Anopheles crucians, Aëdes infirmatus, Aëdes solicitans* and *Culex territans*. S. expresses the opinion that, although these mosquitoes are susceptible to experimental infection, it is doubtful whether any of them would be a successful vector under natural conditions.

The fleas used in the experiments were collected from heartworm-free dogs and transferred to infected dogs, where they remained until they were examined. Examination was carried out by means of dissection and the making of serial sections. Infection was considered to be established when the larvae had entered the haemocoele. Three species of fleas were used, *Ctenocephalus canis, C. felis*, and *Pulex irritans*. All three species acquired infections, *C. canis* being the most susceptible species.

Infection in fleas produces no tissue damage, in contrast to the effect in infected mosquitoes. Owing to their susceptibility to infection, immunity from tissue damage, and their intimate relationship to the definitive host, fleas may play a greater part than is generally realized in maintaining the high incidence of heartworm infection in dogs.—T. E. GIBSON.

See also abstr. **2270–2273** (anthelmintics).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

*HARBITZ, F. (1942). **[Tumours in Animals].**—*Norsk VetTidsskr.* p. 193. [Abst. from abst. in *Skand. VetTidskr.* **32.** 633–637]. **2156**

A summary of three years' work at Oslo Veterinary College on neoplasms seen during routine work in the pathology department. 397 tumours were seen, 76 from horses, 165 from cattle, 3 from sheep, 1 from a goat, 16 from swine, 106 from dogs, 11 from foxes, 5 from cats, 1 from a marten, 4 from rabbits, and 9 from birds.

The findings are described and analysed according to classification. The abstract appears to contain all the essentials concerning type of neoplasm and host. —J. E.

*PIRES, R. E. (1939). Tumor mixoide no caracao de um bovino. **[Tumour in a Bovine Heart].**—*Rev. Fac. Med. vet. S. Paulo.* **1.** 59–66. [Abst. in *Biol. Abstr.* **16.** 195, copied *verbatim*. Signed: E. T. GOMEZ]. **2157**

A tumor in the tricuspid valve of a bovine heart is presented. It was classified as a true neoplasm originating from embryonal remains, in spite of the fact that thrombosis was present on the external surface.

*PIRES, R. E., & MUCCIOLO, P. (1939). Rabdomioma na caracao de um bovino. **[Rhabdomyoma of a Bovine Heart].**—*Rev. Fac. Med. vet. S. Paulo.* **1.** 67–78. [Abst. in *Biol. Abstr.* **16.** 195, copied *verbatim*. Signed: E. T. GOMEZ]. **2158**

A malignant rhabdomyoma of a bovine heart is presented. This tumor was pedunculated and grew in the papillary muscle of the septum in the right ventricle. Histologically it was formed of fusiform cells with young nuclei. Fibrils formed by granules were also found in most of the cells.

MANDRIOLI, A. (1942). Intervento biologico per via endovenosa in due bovini con papillomatosi cutanea diffusa. **[Intravenous Biotherapy in Diffuse Cutaneous Papillomatosis in Cattle].**—*Nuova Vet.* **20.** 186–192. **2159**

This is an account of the successful treatment of two cattle affected with diffuse cutaneous papillomatosis. The therapeutic material is described as being "homologous biological", but the method of preparation is not disclosed.—MILLER WATSON.

*GAWRILOW, W., SZUES, E., & FESTER, A. (1940). Einige Beobachtungen bei der Shopeschen Papillomatose wilder und zahmer Kaninchen. **[Shope Papilloma in Wild and Tame Rabbits].**—*Z. Krebsforsch.* **51.** 100–107. [Abst. in *Biol. Abstr.* Sect. F. **16.** No. 9. 11, copied *verbatim*. Signed: H. E. EGGERS]. **2160**

The virus of the Shope papillomatosis kept its infectivity for yrs., when kept in 50% sterile glycerin in the cold. With material from the wild cotton-tail rabbit, it was possible to infect dark-colored tame rabbits. The papillomas so induced were capable of spontaneous healing, and were not further transferable, nor were the writers successful in getting an active virus from carcinomas so induced. In the carcinomas they found with some regularity, both in mitosing and non-mitosing cells, inclusion bodies which they believe represent the virus.

PIRIE, A. (1942). **A Hyaluronidase and a Polysaccharide from Tumours.**—*Brit. J. exp. Path.* **23.** 277–284. **2161**

All the mouse, rat, and g. pig tumours tested contained a weak hyaluronidase; of three fowl tumours tested, only Mill Hill I showed any activity and that very slight; young Shope papillomas gave inactive extracts. Results of experiments carried out to see if incubation of fowl tumour tissues (which contained no hyaluronidase) with testis hyaluronidase for different periods and at varying temperatures would liberate otherwise unextractable virus, showed that under no conditions was a significantly greater titre of virus obtained.

A viscous polysaccharide was isolated from two fowl tumours which contain no hyaluronidase; analyses showed that the polysaccharide was similar to hyaluronic acid. It was found that preparations of this polysaccharide from tumours contained varying amounts of copper which catalyses a reduction in viscosity of the polysaccharide by ascorbic acid. It is suggested that the variability of the Cu content indicates that the presence of Cu in these preparations of polysaccharides may be fortuitous or that an organic Cu compound is an impurity in the preparations.—R. ALLCROFT.

ZAHL, P. A., & HUTNER, S. H. (1943). **Action of Bacterial Toxins on Tumors. III. Some Biological Properties of Purified *Salmonella typhimurium* Endotoxin.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 116–118. [For previous parts, see *V. B.* **13.** 250]. **2162**

The O antigen of *S. typhi-murium*, at three different stages of purification, was tested for toxicity (m.l.d. in mice), tumour haemorrhage production (intraperitoneal injection in mice with implanted mouse sarcoma 80), and antigenic properties (intraperitoneal injections in mice). The stages of purification were :– (1) after

acetone precipitation from concentrated culture; (2) after warm phenol extraction of the initial acetone precipitate, and (3) after various formamide treatments of the phenol extract. Phenol extract gave a potent toxin, but the yield was low. The formamide products were not markedly more toxic or more active in producing tumour haemorrhage than the phenol products. All three antigen fractions possessed the three properties investigated, but treatment with phenol and formamide caused an increase in "tumour haemorrhage producing activity" which was much greater than the increased toxicity for mice (m.l.d. fell from 1,300μg. to 400μg., whereas the "minimal haemorrhage dose" fell from 6μg. to 0·1μg.).—E. G. White.

Kline, B. E., Wasley, W. L., & Rusch, H. P. (1942). **Tumor Inhibitor Studies. I. The Effect of Pure Chemical Compounds on Tumor Takes.**—*Cancer Res.* **2.** 645–648. **2163**

Flexner-Jobling carcinomatous tissue (from actively growing tumours) was mixed in the syringe with a neutral solution of the compound under test and injected into albino rats. In the case of β-indolebutyric acid, β-indolepropionic acid, sodium trichloracetate, chloral hydrate, and chloretone, this procedure is claimed to have prevented the tumour from "taking". Negative results were obtained with 40 other compounds, including animo acids, urea and substitution compounds, B vitamins, guanidine and related compounds, histamine phosphate, and sulphonamides.—A. N. Worden.

Thompson, J. H., Holt, P. F., & Callow, H. J. (1943). **Inhibition of Tumour Growth. [Correspondence].**—*Nature, Lond.* **151.** 364–365. **2164**

The effect of a tendency towards acidosis on the growth rate of implanted tumours in mice was examined by replacing the drinking water with a 0·6% solution of ammonium chloride. The treated groups showed average inhibitions in size varying from 27·4–50·0% and in weight from 25–50% as compared with controls. Weights were taken after drainage of cystic fluid so that variations in tissue fluid content did not account for the differences in size. There was no retardation in body growth and attempts to measure the degree of acidosis by titration of urine were unsuccessful, owing to large individual variations.

The use of ammonium acetate gave a less inhibitory effect than the chloride, while the lactate appeared to have an acceleratory effect.

The authors urge caution in the interpretation of results obtained after administration of substances to tumour-bearing animals, pointing out that most of those shown to be inhibitory have been acids or substances which could easily give acids, and that in tissue extracts some part of the activity may be due to relatively simple salts.—E. J. M. Hayward.

Ball, H. A. (1942). **Effect of Intravenous Glycogen Administration on the Rate of Growth of the Walker Carcinosarcoma 256 and Sarcoma 180.**—*Cancer Res.* **2.** 823–827. **2165**

The rate of growth of the two tumours, as determined by measurement of the mean diameters, was diminished in short-term experiments in which treated mice received small intravenous doses of a 10% solution of glycogen.—Alastair N. Worden.

Bergmann, F. (1942). **On the Mechanism of Tumor Production by Chemical Agents.**—*Cancer Res.* **2.** 660–663. **2166**

There is a general discussion of the subject and no original work is described. The suggestions are made that the activity of a carcinogenic hydrocarbon and of its related heterocyclic compounds is determined by form and size, the activity of closely related compounds resembling that of a given parent structure; that in the living cell the carcinogens are adsorbed by "an acceptor possessing a definite adsorption area", which sets an upper limit for the dimensions of active compounds, and that a carcinogen may be inhibited by interference with its proper adsorption. An ideal carcinogenic structure is postulated.—A. N. Worden.

Nelson, A. A., Fitzhugh, O. G., Morris, H. J., & Calvery, H. O. (1942). **Neurofibromas of Rat Ears Produced by Prolonged Feeding of Crude Ergot.**—*Cancer Res.* **2.** 11–15. **2167**

Feeding of rats for periods up to two years with a diet containing 5% crude ergot resulted in the formation of neurofibromas, confined to the ears, in 23 of 38 animals. The incidence of such tumours on a diet containing only 2% ergot was ten of 38 rats, and on a 1% ergot diet it was one of 38. Removal of ergot from the diet caused regression, followed by recurrence when it was again fed. Some animals fed ergot showed renal medullary necrosis and calcification, and enlargement of the ovaries. There were no vascular lesions or evidence of cutaneous necrosis, probably because the dosage of the alkaloids was too low. No experiments to determine the constituent of ergot responsible for tumour formation have as yet been carried out.
—E. G. White.

Lewisohn, R., Leuchtenberger, C., Leuchtenberger, R., Laszlo, D., & Dische, Z. (1942). **Influence of a Polished Rice Diet upon Spontaneous Mammary Cancers in Mice Treated with Yeast Extract.**—*Cancer Res.* **2.** 818–822. **2168**

It is claimed that the substitution of a polished-rice and carrot diet for the mouse-pellet and carrot diet previously fed, greatly augmented the beneficial action of the intravenous injection of yeast-extract. The average time for complete regression of mammary carcinomas in the 63% of animals which responded to treatment, is said to have been only 20 days. The polished-rice and carrot diet had no influence in the absence of yeast therapy.—Alastair N. Worden.

*Graffi, A. (1940). Einige Betrachtungen zur Ätiologie der Geschwülste speziell zur Natur des wirksamen Agens der zellfrei übertragbaren Hühnertumoren. **[Nature of the Infective Agent of Fowl Tumours].**—*Z. Krebsforsch.* **50.** 501–551. [Extract from abst. in *Biol. Abstr.* Sect. F. **16.** No. 9. 11, copied *verbatim*. Signed: H. E. Eggers]. **2169**

This is a detailed exposition of the writer's hypothesis that the filterable agent of fowl tumors consists essentially of anaplastic, minute mitochondria. Starting with the postulates that in malignancy there is a suppression of normal specialized cellular activities, with diversion of cell energy to reproduction, and that this shift of activity is determined by alterations in the microcellular structures—mitochondria, lipochondria, etc., the identification of the filterable agent with mitochondria is suggested on the grounds of similar solubilities, chemical similarities, the appearance of antibodies to the Rous viruses in sera of fowls with chemically induced tumors, the sp. and tissue specificities of the tumor-inducing viruses, and the morphological similarities of the granules of the viruses and mitochondria.

Potter, J. S., & Ward, E. N. (1942). **Mitochondria in Lymphocytes of Normal and Leukemic Mice.**—*Cancer Res.* **2.** 655–659. **2170**

In lymphatic leucaemia in man, most workers have found that the lymphoid cells involved contain an increased number of very fine mitochondria, in contrast to the more coarse structures found in normal lymphocytes. The present article deals with the number, size,

shape, and distribution of mitochondria in different populations of leucaemic and normal lymphocytes in mice of strain C 58. Most of the observations were made on material stained supravitally with Janus green B and neutral red. The number of mitochondria appears to be correlated with the average cell size of a given population, the normal population having the smallest average size, spontaneous leucaemia next, and transmissible leucaemia the largest. More significant, however, is the correlation between the age of the lymphocytes and the amount of mitochondrial material, the most immature cells being richest in mitochondria. It is almost certain that in the lymphopoietic tissues of the mouse the larger cells are the young ones, as judged by their ability to divide and the degree of basophilia. It appears that particular stages of differentiation of the normal and leucaemic lymphocyte have the same mitochondrial characteristics and that leucaemic cells as such do not possess an aberrant mitochondrial content.—E. G. WHITE.

CARR, J. G. (1942). **Observations upon Spontaneously Recurring Rous No. 1 Tumours.**—*Brit. J. exp. Path.* **23**. 206–213. **2171**

The usual result of inoculation of Rous no. 1 agent into a fowl is the production of a rapidly growing, very malignant sarcoma which causes death in 3–4 weeks. C. found in a number of birds that tumours appeared many months after inoculation of the agent, the original induced tumour (if any) having long since disappeared. The agent could not be demonstrated in these recurring tumours, but was present in the usual amount in grafts from them.—E. G. WHITE.

POLLARD, M., & HALL, W. J. (1942). **Avian Leukosis Complex.**—*J. tech. Meth.* No. 22. pp. 41–48. **2172**

A general brief review, chiefly of American research, with 50 references.—J. E.

DOLJANSKI, L., & PIKOVSKI, M. (1942). **Agent of Fowl Leukosis in Tissue Cultures.**—*Cancer Res.* **2**. 626–631. **2173**

The "strain T_1 of haemocytoblastosis" [see ENGELBRETH-HOLM—*V. B.* **6**. 258.] was employed. Normal bone marrow and myocardium which were cultured for periods of 3–4 weeks in plasma obtained from infected chickens at the height of the disease proved infectious when inoculated into normal chickens. Normal chick fibroblasts which were infected with strain T_1 remained infective for periods up to 38 days when cultured in diluted plasma. By serial cultivation of the infected fibroblasts, it is claimed that the agent could be maintained alive for 178 days. Both the fibroblasts and the cell-free supernatant proved infective, but in the absence of living cells the culture became inactive in under 24 hours. No morphological abnormalities were noted in the infected fibroblasts.—A. N. W.

See also absts. **2287** (bovine leucosis), **2274** (vitamins and fowl paralysis).

DISEASES, GENERAL

DOUGLAS, A. (1942). **Scheme for the Control of Diseases of Dairy Cattle.**—*Vet. Rec.* **54**. 505–506. **2174**

D. discusses the working of the Survey Scheme prepared by the National Veterinary Medical Association of Great Britain and Ireland [see *V. B.* **11**. 703.] and its possibilities from the point of view of the Ministry of Agriculture. He considers that better results are likely in the control of infertility than of mastitis, but every means at present known would be used to control mastitis and any new treatment evolved would be tried. He discusses the use of the vaccines for *Brucella abortus* infection issued by the Ministry of Agriculture.

He urges a close liaison between practitioners and the laboratory and the staff dealing with infertility.

In the control of Johne's disease he considers attention to hygiene under veterinary supervision is all that can be done at present to limit losses, until a more reliable means of diagnosis is available.—J. A. G.

*MÖLLER, H. (1939). Ueber das Vorkommen von Tuberkulose und Amyloidose in den innersekretorischen Drüsen von Jungrindern und Kälbern. **[TB. and Amyloidosis in the Endocrine Glands of Young Cattle and Calves]**.—*Inaug. Diss., Hanover.* [Abst. from abst. in *Berl. Münch. tierärztl. Wschr.* March 28th. 160]. **2175**

Neither TB. nor amyloidosis was found in any of the endocrine glands of 104 tuberculous young cattle or 32 tuberculous calves examined. Those examined included the thyroid, adrenal, parathyroid, thymus, pituitary, and pineal glands.—J. E.

PACCHIONI, G. (1942). Sul comportamento di talune manifestazioni patologiche in animali affetti da infezioni associate sperimentali. Nota I—Osservazioni sulla associazione: bruc. abortus–tubercolosi in ovini e conigli. **[Pathological Manifestations in Animals Experimentally Affected with Simultaneous Infections. I. Brucellosis and TB. in Sheep and Rabbits]**.—*Nuova Vet.* **20**. 199–204. **2176**

Sheep and rabbits were artificially infected simultaneously with tubercle bacilli and *Brucella abortus*. P. did not find that this caused any modification worthy of notice in the development of the tuberculous lesions or in the agglutination titres to brucella.—M. WATSON.

—. (1943). **[Discussion on] the Problems of Backyard Poultry and Rabbits.** [Speakers: BAKKER, T., GORDON, R. F., HARE, T., & ORR, A. B.]—*Vet. Rec.* **55**. 81–87. **2177**

BAKKER'S paper is so full of information of great value to the small poultry keeper and the veterinarian, that an abstract cannot do it justice. He reviewed the conditions most suitable for keeping poultry under restricted conditions. These come under two main headings :– (1) the design and layout of houses, ventilation, lighting, etc., and (2) nutrition. Many of the common poultry vices are as much due to bad housing as to faulty nutrition and both have an obvious bearing on the incidence of disease and on productivity. B. gave an analysis of 140 P.M. examinations of "backyard poultry" that had died from various causes.

GORDON stated that the ailments with which the backyard poultry keeper has to contend are different from those dealt with by the large poultry keeper and often require the aid not of a laboratory, but rather of a clinician who can point out defects in management responsible for the conditions, or recommend treatment. Reference was made to the frequency of "egg peritonitis" (often associated with *Salmonella pullorum* infection), to both external and internal parasitism and to the various forms of lymphomatosis. G. also mentioned the unfortunate results which have followed the use of cocoa waste products and cited 20 cases. As low a proportion as 5% cocoa waste in the ration has produced unthriftiness.

G. considered coccidiosis to be by far the commonest rabbit disease. All the cases of TB. which he encountered were considered to be due to the bovine strain.

Up to September 30, 1942, HARE and ORR had investigated 589 outbreaks of disease (table given).

Though fowl paralysis accounted for 24·8% (mean average of five years and an index of the severity of the disease in 1936), no cases had been observed in stock bred during 1942. TB. caused losses second only to those due to F.P. This was felt to be largely due to the promiscuous sale and purchase of " culls " from other flocks. Coccidiosis was considered to be the most serious scourge of rabbits and proper hut hygiene to be the best remedy.—N. S. BARRON.

HÜBSCHER, B. (1939). Beitrag zur Therapie der Magen-Darm-Affektionen des Pferdes. **[Treatment of Gastro-Intestinal Diseases of the Horse].**—*Inaug. Diss., Zurich.* pp. 74. **2178**

This is a detailed account of the various forms of " colic " in the horse and their treatment, based on H.'s experience during 28 years of practice and the records of the Zurich clinic from 1901–1938. There are many case histories which provide a wealth of information as to symptoms, diagnosis, treatment and, in fatal cases, P.M. findings. During the period 1901–1938, 3,716 cases of " colic " were examined at the Zurich clinic and the mortality was 10%.

The differential diagnosis of the various forms of " colic " is difficult and further research is needed into such problems as the movements of the stomach and intestines and their relation to the vagus and sympathetic nerves, and a chemical and bacteriological study of the gastric and intestinal contents in health and disease should be made.

In acute gastric tympany the only treatment of value is lavage. Acute gastritis, usually combined with enteritis, is often successfully treated by gastric lavage followed by administration of silver nitrate solution and adsorbents such as animal charcoal. The types of " colic " most often met with at the Zurich clinic were " catarrhal intestinal spasm ", impaction of the large intestine, and meteorism. Severe tympany of the large intestine should be treated by puncture of the distended portion of intestine through the rectum: this procedure is effective, simple, and without danger. In cases of impaction of the large gut such agents as arecoline, lentin, or barium chloride should only be used after the impacted material has been softened by administration of such medicaments as sodium sulphate, liquid paraffin, castor oil, and by enemas. After this preliminary measure, the use of vagal and muscle stimulants is without danger.

Thrombo-embolic colic is uncommon in spite of the high incidence of parasitic aneurysms. Only five cases were seen at the Zurich clinic during a period of 14 years, and these and the cases seen in practice by H. were all fatal.

The various forms of intestinal displacement, *viz*, volvulus, intussusception, strangulated hernia etc., always ended in death whatever medical treatment was adopted. DOENECKE, however, claims successful results from laparotomy and manipulation of the displacement. Diagnosis is helped by peritoneal puncture, which yields a haemorrhagic exudate. At the Zurich clinic, the distended portion of intestine is punctured and, if the general condition allows, the animal is rolled. This treatment is sometimes successful in cases of twist of the pelvic flexure of the colon.

In agreement with the results of other workers, it was found that " colic " cases are more frequent during the summer months (May-September).—E. G. WHITE.

ANDREWS, J. S., MORALES OTERO, P., & MALDONADO, J. F. (1942). **Observations on Flatulent Colic in Puerto Rican Solipeds.**—*J. Amer. vet. med. Ass.* **101.** 472–476. **2179**

This is an account of the condition known as " epizootic flatulent colic " of solipeds in Puerto Rico and the adjacent islands.

The observations are based on P.M. examinations of 23 cases, a report on 32 cases in an outbreak on the island of Vieques, and the results of experimental laboratory work.

The disease occurs during the rainy season when the grass is freshly green, particularly on newly flooded pastures or when animals are fed cut green grass from swampy areas. Tympany is usual and the symptoms are those of colic due to undigested green fodder. P.M. examinations of 12 cases are summarized. The most common finding is acute enteritis.

A *Clostridium* was isolated from the grass and " molasses water " mixture used as a fodder on the island of Vieques. It grew anaerobically in plain broth, and since it fermented maltose, lactose, sucrose, glucose, salicin, and glycerol, producing acid and gas, was believed by the authors to be *Cl. botulinum*. A culture of the organism when fed to a horse caused death in 48 hours. A similar organism recovered P.M. from the intestine of a naturally affected horse failed to reproduce the disease.

A 48-hour " blood culture " of *Cl. botulinum* Type A, obtained from a " standard culture " of the organism, when administered to a horse, caused symptoms of flatulent colic and death within 24 hours. A second horse died 24 hours after being fed a filtrate of a broth culture of this organism. The authors were unable to provide evidence as to whether the disease is botulism or not.—J. A. GRIFFITHS.

THORP, W. T. S., SHIGLEY, J. F., & FARRELL, M. A. (1942). **Studies on the Etiology and Pathology of Calf Pneumonia.**—*Amer. J. vet. Res.* **3.** 342–349. **2180**

Histopathological studies were carried out on 28 cases of calf pneumonia. The lesions were typical of interstitial broncho-pneumonia. There was pleurisy in 18 of the cases.

Details of bacteriological studies made in 24 of the cases are given. The two groups of organisms which were isolated were:–(1) Gram-negative non-motile rods, and (2) Gram-variable coccobacilli. The former resemble members of the genus *Haemophilus* and serologically they were found to show a relationship to *Haemophilus suis*.

Results of attempts to set up pneumonia in calves by the inoculation of cultures of group (1) were not consistent nor conclusive. It is suggested that a virus may be responsible for the disease.—J. A. GRIFFITHS.

MEYEROWITZ, B. (1942). **An Anomaly in Hog Hearts: Defectus Interventricularis Septi.**—*Amer. J. vet. Res.* **3.** 368–372. **2181**

Congenital deficiencies of the interventricular septum were found in 14 pigs during routine P.M. meat inspection. All were young animals in good condition. The largest opening was 1 in. in diameter. The abnormality appears to be quite common and is very often associated with other congenital anomalies, of which a patent foramen ovale was most frequent in this series.

In its relative frequency, position of the foramen, and secondary effects, such as cardiac dilatation and hypertrophy, fibrosis of the myocardium and enlargement of the pulmonary artery, the defect in pigs conforms to the published accounts of the condition in man.—J. W. WHITTICK.

IWANOFF, X. (1942). Ein Fall von besonderer Pigmentierung der Nieren einer Ziege. **[A Case of Pigmentation of the Kidneys in a Goat].**—*Arch. wiss. prakt. Tierheilk.* **77.** 386–388. **2182**

The otherwise normal kidneys of a goat slaughtered for meat showed a heavy black pigmentation of the cortex. The pigment was confined to the basal membrane of the convoluted tubules and could not be identified in spite of the application of various reagents to histological sections. [Whether the pigment was impregnated on treatment with silver nitrate or bleached by such agents as potassium permanganate, sodium thiosulphate, or free chlorine is not mentioned, so that it is possible that the pigment was melanotic in nature. Melanosis of various organs, including the kidney, occurs in calves and lambs.]—E. G. WHITE.

MENKIN, V. (1943). **Studies on the Isolation of the Factor Responsible for Tissue Injury in Inflammation.** —*Science*. **97**. 165–167. **2183**

A partially purified substance, here named necrosin, was obtained from wound exudates which, on injection into heterologous and homologous species, caused the characteristic appearance of inflammation. The substance was found to be a protein in the euglobulin fraction. The effect was not produced by a fraction similarly isolated from normal blood serum. It would thus appear that injury causes the liberation of a protein substance from the injured cells which is the cause of increased capillary permeability, diffusion of fibrinogen, precipitation of fibrin, and consequent lymphatic blockage already shown by M. to be characteristic of inflammation.—R. MCANALLY.

LOOFBOUROW, J. R., WEBB, A. M., LOOFBOUROW, D. G., & ABRAMOWITZ, R. K. (1942). **Proliferation-promoting Intercellular Hormones. 3. Relation of Aeration to the Activity of Proliferation-promoting Factors from Injured Cells.**—*Biochem. J.* **36**. 513–518. [For previous parts, see *V. B.* **12**. 296]. **2184**

LOOFBOUROW, J. R. (1942). **Intercellular Hormones. 4. Further Observations Regarding the Mechanism of the Production and Release of Proliferation-promoting Factors by Injured Cells. 5. Evidence that the Proliferation Promoting Effect of Damaged-Cell Products is Attributable to Adenine Nucleotides and known Growth Factors.**—*Ibid.* 631–638 & 737–745. **2185**

3. The growth-promoting substance extracted by water from yeast cells slowly killed by ultra-violet irradiation was much more active in promoting proliferation of cells in an aerated than a non-aerated suspension of yeast. This suggests that the wound hormone plays a part in the respiration cycle. The ultra-violet absorption spectra of the injured cell extract indicated the presence of a purine or pyrimidine and the effect of pH on the spectra resembled that upon the spectrum of adenine. The spectra after reduction did not correspond with those of reduced coenzyme I or II nor did biological tests for coenzyme I give positive results.

4. Yeast cells slowly killed by ultra-violet irradiation were shown by microscopic examination, cell counts, and the absence of protein in the medium, to be largely intact. Thus, the presence of a growth-promoting substance in the extract is not due to autolysis and may therefore be due (1) to increased membrane permeability, or (2) to increased production of the substance within the cell. A decrease in the size of cells during irradiation indicated (1). The total growth-promoting units in the extract, together with the autolysate of residual cells in an irradiated suspension, was greater than a similar total in a non-irradiated suspension; this result indicated (2). It is concluded that (1) and (2) are both concerned.

5. The extract of damaged yeast cells was shown to contain various constituents responsible for the proliferation-promoting property. These were:– a heat-labile factor; a fraction which through various extraction procedures follows a fraction which has ultra-violet absorption spectra characteristic of nucleotides; a portion whose effect was simulated by certain known growth factors and amino acids. Of various nucleotides tried in combination with known growth factors, adenosine triphosphate best simulated the effect of damaged cell extract.—R. MCANALLY.

COOK, E. S., & CRONIN, A. G. (1942). **Proliferation-promoting Activities of Extracts from Ultra-violet Injured Yeast Cells and of Bios Components. [Correspondence].**—*Nature, Lond.* **150**. 93–94. **2186**

The cell proliferation-promoting property of extract of yeast cells damaged with ultra-violet irradiation could not be wholly reproduced by a number of known growth substances and amino acids.—R. McA.

I. DOLJANSKI, L., HOFFMAN, R. S., & TENENBAUM, E. (1942). **Effect of Extracts of Heterologous Adult Tissue on Cell Growth *in vitro* and their Use in Wound Healing. [Correspondence].**—*Nature, Lond.* **150**. 23–24. **2187**

II. WERNER, H., & DOLJANSKI, L. (1942). **Partial Purification of Cell Growth-Promoting Principles in Adult Tissue Extract. [Correspondence].**—*Ibid.* 660–661. **2188**

I. Extract of adult cow, sheep, rabbit, and dog heart muscle stimulated the growth of *in vitro* cultures of chicken-heart fibroblast; extract of adult fowl heart stimulated growth of cultures of human skin. The use of extracts of adult tissues in promoting wound healing is advocated.

II. The cell growth-promoting principle of adult sheep or fowl heart was partially purified. The initial step was solution in Ringer and precipitation with alcohol. The alcohol precipitates were found to be potent in cell growth-promoting power and their use in clinical experiments on wound healing is advocated. —R. MCANALLY.

See also abst. **2132** (summer eczema in dogs).

NUTRITION AND METABOLIC DISORDERS

SUGIURA, K. (1942). **The Relation of Diet to the Development of Gastric Lesions in the Rat.**—*Cancer Res.* **2**. 770–775. **2189**

The addition of kieselguhr to a polished rice diet accentuated the development of epithelial hyperplasia in the forestomach, and of diffuse haemorrhage in the glandular portion of the stomach, in young rats of the Sherman strain. The action is attributed to mechanical irritation.—ALASTAIR N. WORDEN.

BRIGGS, H. M. (1943). **The Use of Cottonseed Meal in the Ration of Pregnant Ewes.**—*J. Anim. Sci.* **2**. 27–32. **2190**

In an experiment reported by S. F. RUSSEL in 1919, cottonseed fed at the level of 0·5 lb. per head per day was believed to be responsible for illness, deaths, and a single abortion among a group of 20 pregnant ewes. In the more extensive experiments reported in the present paper, the feeding of 0·25 or 0·5 lb. of cottonseed daily, together with lucerne hay or prairie hay, did not interfere with health; pregnant ewes lambed normally and reared healthy lambs.—A. N. W.

HOGAN, A. G., & JOHNSON, S. R. (1940). **Inadequacy of the Concentrates Commonly Used in Swine Feeding.** —*Res. Bull. Mo. agric. Exp. Sta.* No. 321. pp. 20. **2191**

Rations comprising maize (67–78%), tankage

(0–10%), linseed oil meal (5–10%), lucerne meal (5%), cod liver oil (1%), and a mineral mixture (2%), with additions in some cases of wheat bran, dried buttermilk or dried skim milk, proved inadequate for optimal reproductive performances in brood sows. Food consumption both before and after farrowing was low, and the sows sometimes exhibited such symptoms of deficiency as scanty hair, scaly skins, lameness, and a swaying motion. Mortality among the offspring was high and the average weaning weights were poor. The offspring were sometimes affected with skin lesions, muscular incoordination, weakness and diarrhoea. Among those which died in collapse, P.M. findings included fatty liver and kidneys and what are described as " haemorrhagic areas ".

It is concluded that the concentrates commonly used in pig feeding are inadequate as the sole ration for brood sows.

There is a useful review of some of the relevant British and American literature.—ALASTAIR N. WORDEN.

MIRSKY, I. A., ELGART, S., NELSON, N., & WASSERMAN, P. (1942). **Fibrosis of the Pancreas in Meat-Fed Ducks.**—*Amer. J. Path.* **18.** 1159–1163. [Author's summary copied *verbatim*]. **2192**

Ducks maintained on a diet of meat and cod liver oil develop pancreatic fibrosis that apparently is progressive. The first changes are seen in about 8 months.

MADDEN, S. C., CARTER, J. R., KATTUS, A. A., Jr., MILLER, L. L., WHIPPLE, G. H. (1943). **Ten Amino Acids Essential for Plasma Protein Production Effective Orally or Intravenously.**—*J. exp. Med.* **77.** 277–295. **2193**

In dogs brought to a steady state of hypoproteinaemia by plasmapheresis [see MADDEN & WHIPPLE—*V. B.* **10.** 797.], excellent plasma production, body weight, and a positive nitrogen balance were maintained when the protein of the ration was completely replaced by Rose's growth mixture of crystalline amino acids, *viz*, phenylalanine, histidine isoleucine, leucine, tryptophane, methionine, lysine, threonine, valine, and arginine, given by mouth or intravenously. The replacement of methionine by cystine permitted equally good plasma production for short periods, but only at the expense of body weight and nitrogen balance. The effects of removal of certain individual acids were studied. The results indicate that the growth mixture of amino acids should be a valuable addition to transfusion and infusion therapy in disease states associated with deficient nitrogen intake, or tissue injury and accelerated nitrogen loss, including shock, burns, and major operative procedures. The fact that choline cannot replace methionine in the above amino acid mixture is discussed and further contributions are made on the controversial subject of exogenous and endogenous nitrogen metabolism.—ALASTAIR N. WORDEN.

ALBANESE, A. A., RANDALL, R. MCI., & HOLT, L. E., Jr. (1943). **The Effect of Tryptophane Deficiency on Reproduction.**—*Science.* **97.** 312–313. **2194**

Female rats which were provided with a tryptophane-deficient diet after mating showed foetal resorption between the ninth and 14th day of pregnancy. A control animal receiving tryptophane had normal foetuses when killed on the 14th day.

Attention is drawn to reports of reproductive failure in farm animals receiving low-protein diets, and it is suggested that tryptophane-deficiency may be a factor.—ALASTAIR N. WORDEN.

RAVDIN, I. S., THOROGOOD, E., RIEGEL, C., PETERS, R., & RHOADS, J. E. (1943). **The Prevention of Liver Damage and the Facilitation of Repair in the Liver by Diet.**—*J. Amer. med. Ass.* **121.** 322–324. Discussion pp. 324–325. **2195**

The opinion is expressed that neither a high-carbohydrate diet nor intravenous injection of glucose is sufficient to protect the liver against toxic agents. A pre-operative diet which provided 3,000 calories per day and contained approximately 74% carbohydrate, 20% protein, and 6% fat, together with supplements of yeast, vitamin B_1 and a bile-salt preparation, is claimed to have proved extremely beneficial to patients with evidence of long-standing biliary dysfunction admitted for surgical interference with the biliary tract. In 37 severe cases so treated, the mean fatty acid content of the liver was 14·2%, compared with 4·2% in the case of ten control patients not receiving such a diet. A similar diet is said to have been useful during the convalescence of biliary tract patients.—A. N. WORDEN.

JOHNSON, S. R. (1943). **Studies with Swine on Rations Extremely Low in Manganese.**—*J. Anim. Sci.* **2.** 14–22. **2196**

In a continuation of studies already reported [see *V. B.* **11.** 549.] growth but not reproduction was satisfactory on the low (<0·5 p.p.m.) Mn ration. Pregnant sows so fed gradually lost their hair, developed scaly skins, and exhibited " a characteristic odour ". Reproduction was satisfactory on diets containing 6 p.p.m. Mn. The Mn content of the livers of growing pigs receiving the high (6 p.p.m.) Mn ration ranged from 4–15 p.p.m., as compared with 1–6 p.p.m. for animals on the Mn-deficient diet.—A. N. WORDEN.

SHARPLESS, G. R., PEARSONS, J., & PRATO, G. S. (1939). **Production of Goiter in Rats with Raw and with Treated Soy Bean Flour.**—*J. Nutrit.* **17.** 545–555. **2197**

Rats fed diets containing 35–93% unprocessed soybean flour plus yeast, sugar, butterfat, sodium chloride, and calcium carbonate developed enlarged thyroid glands about four times the normal size in an experimental period of seven weeks. Addition of 0·5 mg. % KI to a diet containing 75% soybean flour prevented the development of goitre. Estimation of the iodine content of the diets showed that the goiterogenic activity was not dependent initially on the iodine content. The minimum I_2 requirement of rats fed the goitrogenic diet was found to be twice the normal or approximately 50 μg. per 1,000 calories of food; the optimum I_2 requirement was approximately 200 μg. per 1,000 calories, which is also twice the normal. When soybean flour was extracted with ether or acetone, autoclaved, or treated with steam, its goitrogenic activity was significantly reduced.—R. ALLCROFT.

SHARPLESS, G. R., SABOL, M., ANTHONY, E. K., & ARGETSINGER, H. L. (1943). **Goitrogenic Action of Calcium and Vitamin D.**—*J. Nutrit.* **25.** 119–126. **2198**

Under experimental conditions similar to those previously employed [see preceding abst.], calcium chloride was found to be goitrogenic in the presence of vitamin D. In the absence of added vitamin D, however, neither the chloride, the lactate, nor the phosphate of calcium appeared to influence the size of the thyroid. —ALASTAIR N. WORDEN.

GUTOWSKA, M. S., & PARKHURST, R. T. (1942). **Studies in Mineral Nutrition of Laying Hens. II. Excess of Calcium in the Diet.**—*Poult. Sci.* **21.** 321–328. [See also *V. B.* **12.** 116]. **2199**

Varying Ca and P intakes of two comparable groups of 48 artificially inseminated Rhode Island Red pullets were arranged by varying the proportions of calcite flour and steamed bone meal in the rations. Adequate vitamin D was ensured by the addition of 0·5% fortified cod liver oil. On adequate P intake, a level of 3·95% Ca

in the ration of the laying hens was found to be excessive, reducing the biological value of the diet as compared with levels of 2·77% and 2·35%. This was reflected by decrease in egg production and feed efficiency. There was no difference in the egg-shell breaking strength, average egg weight, and the fertility and hatchability of eggs between the groups of birds receiving the varying levels of Ca.—J. P. GARDNER.

*TSIGARAS, C. (1941). La rareté du rachitsme chez animaux en Grece. **[Rarity of Rickets in Animals in Greece].**—*Ann. Méd. vét.* **85.** 273–278. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 349]. **2200**

Because of the strong and constant sunshine in Greece, rickets is seldom found there. T. has seen it in a few calves of the Simmental and Aggler [*sic*; probably a misprint for Angler, *i.e.* Angeln] breeds, and in one horse.—J. G. CARR.

COOPERMAN, J. M., WAISMAN, H. A., & ELVEHJEM, C. A. (1943). **Nutrition of the Golden Hamster.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 250–254. **2201**

A ration of sucrose, casein, minerals, cod liver oil, maize oil, and wheat germ oil supplemented with vitamins B_1, B_6, riboflavin, nicotinic acid, pantothenic acid, inositol, choline, and *p*-aminobenzoic acid was inadequate for growth and survival in young hamsters (*Cricetus auratus*). The addition of 3% of a 1 : 20 extract of liver prolonged survival but did not affect growth. The addition of 1μg. daily of biotin, however, permitted excellent growth and subsequent reproduction. There was no evidence that ascorbic acid was required, whilst withdrawal of nicotinic acid was without effect.—ALASTAIR N. WORDEN.

HARPER, A. A., MACKAY, I. F. S., RAPER, H. S., & CAMM, G. L. (1943). **Vitamins and Physical Fitness.**—*Brit. med. J.* Feb. 27th. 243–245. **2202**

Administration of supplements of vitamins A, C, and D to a group of students resulted in increased stamina and decreased susceptibility to minor respiratory and gastro-intestinal complaints compared with a control group on a similar diet, but given no vitamin supplements.—D. G. GILMOUR.

STEWART, J., & MCCALLUM, J. W. (1942). **The Effect of a Vitamin A-rich Diet on the Vitamin A Content of the Colostrum of Dairy Cows.**—*J. Dairy Res.* **13.** 1–4. **2203**

In an experiment conducted on five farms during 1938–39, 69 pregnant dairy cows were provided with 3 lb. per head per day of carrots from the time the animals came off pasture in October until they calved, the dates of calving being between November and April. Carrots were chosen as a home-grown and readily eaten foodstuff, the incorporation of which would not interfere seriously with the nutritive ratio of the ration. The vitamin A and carotene contents of samples of colostrum taken one and 24 hours after calving were not influenced by this treatment, the values not differing significantly from those obtained from a group of 67 cows serving as untreated controls.

In a second experiment carried out during the following winter, supplementation of the diets of 57 cows with one-seventh of a pint of cod liver oil daily (equivalent to 70,000 I.U. of vitamin A) also failed to influence the vitamin A and carotene content of the colostrum as compared with samples from 50 control animals.—ALASTAIR N. WORDEN.

FELLER, A. E., ROBERTS, L. B., RALLI, E. P., & FRANCIS, T., Jr. (1942). **Studies on the Influence of Vitamin A and Vitamin C on Certain Immunological Reactions in Man.**—*J. clin. Invest.* **21.** 121–137. **2204**

In detailed studies, extending over 6–26 weeks, with five patients, it was not possible to show that either deficiency or high dosage with vitamins A and C had any influence upon :– (1) the capacity of the nasal secretions to inactivate influenza A virus ; (2) the serum titre of neutralizing antibodies for the same virus ; (3) the lysozyme activity of the nasal secretion ; (4) serum complement, and (5) the phagocytic activity of the polymorphonuclear neutrophile leucocytes against pneumococci.—ALASTAIR N. WORDEN.

FOLLIS, R. H., Jr. (1942). **Myocardial Necrosis in Rats on a Potassium low diet Prevented by Thiamine Deficiency.**—*Johns Hopk. Hosp. Bull.* **71.** 235–241. **2205**

A double deficiency of potassium and of vitamin B_1, which was expected to accentuate the myocardial necrosis usually produced by K deficiency, almost prevented its appearance. Characteristic renal lesions of K deficiency were, however, not influenced by the presence or absence of the vitamin. No cardiac changes were observed in vitamin B_1 deficient rats.—A. N. WORDEN.

SWANK, R. L., & PRADOS, M. (1942). **Avian Thiamine Deficiency. II. Pathologic Changes in the Brain and Cranial Nerves (Especially the Vestibular) and their Relation to the Clinical Behavior.**—*Arch. Neurol. Psychiat., Chicago.* **47.** 97–131. [For Part I, see *V. B.* **11.** 54]. **2206**

From a detailed study of birds in which vitamin B_1 deficiency was produced as already described [see *V. B.* **11.** 54.], it is concluded that the primary change within the neurone is a degeneration of the distal portion of the axon. The degeneration proceeds centripetally and is accompanied by slight shrinkage of the cell body. Myelin changes (and probably haemorrhages also) are secondary. Larger fibres are affected first while the smallest fibres may remain intact. In some cases, opisthotonus was not accompanied by nervous lesions. —ALASTAIR N. WORDEN.

HUNT, C. H., BURROUGHS, E. W., BETHKE, R. M., SCHALK, A. F., & GERLAUGH, P. (1943). **Further Studies on Riboflavin and Thiamine in the Rumen Content of Cattle. II.**—*J. Nutrit.* **25.** 207–216. [For previous article, see *V. B.* **12.** 112]. **2207**

A daily ration of 7·5 lb. yellow maize, 3·5 lb. lucerne hay, and 1·5 lb. protein supplement was fed to steers in which a fistula into the rumen had been made, and it was found that ruminal synthesis of riboflavin [see *V. B.* **12.** 112.] was greater when the maize was ground than when it was whole. It was also found that ground maize passed out of the rumen faster than did whole maize, yet left behind a greater amount of soluble material per g. of dry matter. There was little evidence of riboflavin synthesis when maize was withdrawn from the ration, while synthesis appeared to be greater with a high maize than with a low-maize diet. With partially synthetic diets comprising beet pulp, soybean oil meal, regenerated cellulose, wheat starch, cerelose and salt mixture, riboflavin synthesis appeared to be proportional to the carbohydrate content.

There was no satisfactory evidence of vitamin B_1 synthesis with any of the above diets.—A. N. WORDEN.

ANTOPOL, W., & UNNA, K. (1942). **The Effect of Riboflavin on the Liver Changes Produced in Rats by p-Dimethylaminoazobenzene.**—*Cancer Res.* **2.** 694–696. **2208**

In rats receiving a diet of casein, glucose, butter fat, minerals, and cod liver oil, supplemented with vitamins B_1, B_6, calcium pantothenate, and choline, but not with riboflavin, the administration of *p*-dimethylaminoazobenzene was associated with hepatic damage, which in some cases was noted within 25 days. In other animals in which the diet was further supplemented with 60 mg.

of riboflavin weekly, damage attributable to the dye did not occur until after about five months. Control riboflavin-deficient and riboflavin-supplemented groups were maintained, and their respective mean weight increase did not differ significantly from those of the above groups receiving the dye.—A. N. WORDEN.

KORENCHEVSKY, V., HALL, K., & CLAPHAM, B. (1943). **Effects of Vitamins on Experimetal Hyperthyroidism.**—*Brit. med. J.* Feb. 27th. 245–247. **2209**

Groups of rats receiving a stock diet were given small doses of thyroxine, with or without vitamins B, C, A and D. The various organs were weighed and examined histologically after 7–8 weeks. Small doses of thyroxine, besides the well known katabolic effects, had definite anabolic effects leading to better development of such vital organs as liver, kidneys, spleen, heart, adrenals and ovaries. Administration of vitamins did not affect the development of these changes.

Further groups of rats, kept on a diet containing minimal amounts of B vitamins, were given large doses of thyroxine, with or without B vitamins. Atypical katabolic and atrophic changes were seen in the non-vitamin group, resulting in some cases in death. Administration of B vitamins prevented the atypical changes but did not prevent certain typical reactions to thyroxine. This indicated that the administration of large doses of thyroxine under these conditions produced a relative deficiency in B vitamins which complicated the thyrotoxic effects.—D. G. GILMOUR.

FOUTS, P. J. (1943). **Vitamin B Complex Studies in Dogs: Production of Cirrhosis of Liver.**—*J. Nutrit.* **25.** 217–228. **2210**

A protein-low diet comprising 15% casein together with sucrose, cottonseed oil, minerals, cod liver oil, and vitamins A, D, B_1, B_6, riboflavin, and pantothenic and nicotinic acids did not permit of normal growth and well-being in the dog. Animals so fed exhibited anorexia, loss of weight, anaemia, ulceration of the skin, conjunctivitis, peptic ulcer and a fatty cirrhotic liver, and died if left untreated. The condition was neither prevented nor alleviated by feeding *p*-aminobenzoic acid, inositol or 20 mg. per kg. body weight daily of choline, but 50–100 mg. of choline per kg. body weight daily resulted in partial clinical improvement. The combined administration of the high dosage of choline and of a powdered liver extract resulted in complete remission of symptoms, although fibrosis of the liver persisted.

A high protein (41% of casein) diet, qualitatively similar to the above, prevented the development of deficiency symptoms but did not permit of normal growth.—ALASTAIR N. WORDEN.

NAJJAR, V. A., STEIN, H. J., HOLT, L. E., Jr., & KABLER, C. V. (1942). **The Excretion of Specific Fluorescent Substances in the Urine in Experimental Nicotinic Acid Deficiency.**—*J. clin. Invest.* **21.** 263–267. **2211**

Four dogs were provided with a nicotinic acid deficient diet of the Goldberger type. Urinary excretion of the pigment "F_2", which in three cases initially exceeded that of "F", [see *V. B.* **11.** 632.] fell away to zero. The excretion of "F" rose for a time, but later fell away. The changes, which resembled those noted in human pellagra, were reversed by nicotinic acid therapy.—ALASTAIR N. WORDEN.

HUGHES, E. H. (1943). **The Minimum Requirement of Nicotinic Acid for the Growing Pig.**—*J. Anim. Sci.* **2.** 23–26. **2212**

Earlier observations on nicotinic acid deficiency in the pig [see *V. B.* **9.** 494.] were confirmed. The symptoms were completely prevented and weight gains were normal when 10 or 15 mg. of nicotinic acid per kg. body weight daily were given, but 5 mg. was inadequate.—ALASTAIR N. WORDEN.

HUGHES, E. H., & ITTNER, N. R. (1942). **The Minimum Requirement of Pantothenic Acid for the Growing Pig.**—*J. Anim. Sci.* **1.** 116–119. **2213**

Four groups, each of five pigs averaging 30·6 lb. live weight, were provided with a synthetic basal diet which included B_1, B_6, riboflavin and nicotinic acid of the vitamin B complex. The first group did not receive any pantothenic acid, whereas the second, third, and fourth groups were given daily supplements equivalent to 3·6, 7·8, and 11·8 mg. of pantothenic acid respectively per kg. body weight. The animals in the unsupplemented group made an average total gain in weight of under 4 lb. for the 63 days of the experimental period, whereas the supplemented groups made average gains of 25, 28 and 38 lb. respectively. Symptoms of deficiency (rough, dry coat, vomiting, diarrhoea and abnormal gait) were marked in the unsupplemented group and present to a lesser degree in the second and third groups. The fourth group remained clinically normal, while no evidence of enteritis or other lesions was encountered on P.M. examination of two cases.—ALASTAIR N. WORDEN.

BRIGGS, G. M., Jr., LUCKEY, T. D., MILLS, R. C., ELVEHJEM, C. A., & HART, E. B. (1943). **Effect of p-Aminobenzoic Acid when Added to Purified Chick Diets Deficient in Unknown Vitamins.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 7–10. **2214**

The addition of 5–15 mg. of *p*-aminobenzoic acid per 100 g. of diet improved growth and feathering in White Leghorn chicks reared entirely on purified rations low in the unknown vitamins but adequate in other respects; the addition of 0·5% of succinyl sulphathiazole, however, depressed growth and feathering to a greater extent than when on the basal ration above.

Some *in vitro* experiments were carried out with a mixed culture of bacteria obtained from the duodena of chicks which had received one of the basal diets for 1–4 weeks. A medium suitable for the assay of "folic acid" was employed, and *p*-aminobenzoic acid was found to stimulate production of this substance by the bacteria.—ALASTAIR N. WORDEN.

JUKES, T. H., & WELCH, A. D. (1942). **The Effect of Certain Analogues of Choline on Perosis.**—*J. biol. Chem.* **146.** 19–24. **2215**

Eight analogues of choline were fed as supplements to chickens receiving choline-deficient diets, and the growth-promoting and antiperotic activities were compared with those of choline. Arsenocholine and monoethylcholine had antiperotic activities equal to choline and promoted growth to a marked extent, but not as well as choline; betaine and betaine aldehyde had a slight growth-promoting activity but no antiperotic activity; diethylcholine, β-methylcholine, triethylcholine, and α,α-dimethylcholine failed to promote growth although the first two substances had a fairly good antiperotic activity.—ALASTAIR N. WORDEN.

RUSSELL, W. O., & CALLAWAY, C. P. (1943). **Pathologic Changes in the Liver and Kidneys of Guinea Pigs Deficient in Vitamin C.**—*Arch. Path.* **35.** 546–552. **2216**

The subcutaneous injection of trypan blue into g. pigs receiving a scorbutogenic diet led to heavier deposits of the dye in the cells of the liver parenchyma and of the proximal convoluted tubules of the kidney than in the case of normal controls. Fatty changes were detected in the hepatic cells of scorbutic animals, but the appearance of the renal tubules was normal.—ALASTAIR N. WORDEN.

FOLLIS, R. H., Jr. (1943). **Effect of Mechanical Force on the Skeletal Lesions in Acute Scurvy in Guinea Pigs.**—*Arch. Path.* **35.** 579–582. 2217

Immobilization of one of the hind legs in g. pigs receiving a scorbutogenic diet greatly altered the histological picture, as compared with that of the unrestricted limb. At the cartilage-shaft junction of the immobilized limb there was an abnormally broad "lattice" which was not being destroyed and was free from osteoid, but the cartilage itself appeared normal. There was no connective-tissue proliferation and neither "fibrin-like" material nor haemorrhage was observed. In a few cases only were fractures of the lattice detectable.

It is concluded that the "classical" histological picture in scurvy is due largely to the secondary effects of mechanical force.—ALASTAIR N. WORDEN.

DIVE, R. F., & LAVIETES, P. H. (1942). **Serum Magnesium in Thyroid Disease.**—*J. clin. Invest.* **21.** 781–786. 2218

Bound serum Mg was determined in a group of 14 normal subjects, nine patients with untreated hyperthyroidism and four with untreated myxoedema. The total serum Mg did not vary significantly in the three groups, but ultrafiltrable Mg was below the normal level in hyperthyroidism and above the normal in myxoedema with consequent striking differences in the bound fraction. In the four patients with myxoedema all the serum Mg was ultrafiltrable and bound Mg absent. After therapy of thyroid dysfunction, bound and ultrafiltrable Mg returned to normal. In eight patients with elevated basal metabolic rates without hyperthyroidism, bound Mg was normal.

The nature of the bound Mg is speculated upon and since, unlike Ca, it is not combined with protein in general (being completely absent in myxoedema), and the indications are that it is not bound with serum fats, phospholipids and cholesterol, it is suggested that it is associated with a specialized protein such as an enzyme or hormone. It is also pointed out that any explanation of the effect of hyperthyroidism on serum Mg must account for the diminished concentration of ionized Mg as well as the increase in bound Mg.—R. ALLCROFT.

See also abstr. **2243** (calcium), **2316** (vitamins), **2088** (mouldy fodder poisoning), **2092** (intestinal synthesis of vitamins), **2284** (pasteurization and food value of milk), **2274** (vitamins and fowl paralysis), **2109** (vitamin A and influenza), **2168** (diet therapy of cancer).

PHYSIOLOGY AND ANATOMY

*KAPFHAMMER, J. (1941). Vergleichende Untersuchungen an der Lederhaut, Hornhaut, Regenbogenhaut und Aderhaut des Rinderauges. Ein Beitrag zur Biochemie des Auges. **[Biochemical Structure of the Sclera, Cornea, Retina, and Choroid of the Bovine Eye].**—*Graefes Arch.* **144.** 182–185. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 71]. 2219

The sclera contained most hydroxyproline (10·7%) and the iris least (4·8%). The proline content ranged from 3% in the cornea to 7·1% in the choroid. Cornea and sclera contained roughly similar amounts of arginine (7·2% and 7·6% respectively), as did the choroid and retina with 5·4–5·7% each. Data for histidine, tyrosine, cystine, total sulphur and total nitrogen are given in the original article, but not in the abstract.—J. G. CARR.

*SARATA, U. (1938). **Studies in the Biochemistry of Copper. XXXVII. The Normal Blood Copper Content in the Horse and Blood Copper in Septic Conditions. XXXVIII. Copper Content of Bone-Marrow in the Horse in Normal and Anaemic Condition.**—*Jap. J. med. Sci. II. Biochem.* **4.** 203–206 & 207–209. [Absts. in *Biol. Abstr.* Sect. F. **16.** No. 8. 4 and No. 7. 7, copied *verbatim.* Signed: B. S. WALKER]. 2220

XXXVII. In normal geldings, the Cu content of the whole blood ranged from 0·098–0·123 mg. per 100 c.c.: in plasma 0·035 to 0·041 mg. Horses with infectious anemia (5 cases) showed hypocupremia. Horses with strangles (3 cases) showed normal values, as did 1 horse with undetd. fever and 1 horse with septicemia. Another horse with diabetes and septicemia resulting from a carbuncle showed a marked increase in plasma Cu (0·218 mg.).

XXXVIII. The metacarpal or metatarsal bone marrow of 3 normal horses contained from 0·19 to 0·21 mg. Cu per 100 gs. of fresh tissue. In early stages of infectious anemia bone-marrow Cu is almost normal and is gradually reduced as the disease advances.

*BROUWERS, J. (1941). La bilirubinémie à l'état normal et pathologique chez le chien et le cheval. **[Normal and Pathological Bilirubinaemia in the Dog and Horse].**—*Ann. Méd. vét.* **85.** 266–273. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 540]. 2221

The following values for mg. bilirubin per kg. whole blood are given:– normal horses under five years, 10–26 (mean, 15); normal horses over five years, 18–53 (mean, 34); normal cattle, pigs and dogs, 70·5. Rises were noted in hepatic diseases of horses and dogs, but there was no relation between the severity of the illness and the degree of bilirubinaemia. Horses with hepatic cirrhosis had values of 36–62, and those with *Echinococcus* cysts, 23–60. Values ranging from 71–500 were found in dogs with liver disease.—A. N. WORDEN.

WEINHOUSE, S. (1943). **The Blood Cholesterol.**—*Arch. Path.* **35.** 438–500. 2222

The normal physiological variations of blood cholesterol and the metabolism of cholesterol and its relation to pathological conditions are reviewed.

The total cholesterol (T.C.) of human blood varies between wide limits (100–400 mg. %), but in any individual, after a rise during the first four days of life and a gradual increase during childhood, it remains fairly constant. Red cells contain less and white cells more T.C. than plasma. The ratio of free cholesterol (F.C.) to esterified cholesterol (E.C.) is remarkably constant in normal human beings at 25–30%. Cholesterol appears to owe its solubility in blood to a combination with protein. Dietary and environmental conditions have little effect upon the cholesterol of human blood, but some individuals may have a lower tolerance for cholesterol in the diet. A lowering of the blood cholesterol during menstruation and a rise during pregnancy has been observed in human beings, but the latter effect has not always been shown in animals. The blood cholesterol of herbivores (rabbit and g. pig), which is normally low, is notably raised by even small amounts of cholesterol in the diet.

Balance experiments indicate that cholesterol can be synthesized by the body, but the site and chemical pathway of synthesis are unknown. The route of breakdown is also in doubt. Cholesterol is selectively absorbed over other, including plant, sterols through the lymphatic system, thus the herbivore must synthesize all its requirements. The liver appears to be a depot for cholesterol. Excretion occurs principally from the large intestine in man, but in herbivores there is no apparent excretion over and above the plant sterols contained in the food. This fact may account for the low tolerance for cholesterol noted in rabbits.

Liver disease increases the ratio F.C.: E.C., while biliary obstruction increases T.C. but does not affect

the ratio. This fact may be of diagnostic value. Gall stones are due to a lowering of the solubility of cholesterol due to a decrease in the ratio of bile salts to cholesterol. This ratio is normally much greater in animals than in man, thus the lower incidence of gall stones in animals is accounted for. Increase in blood cholesterol is associated with kidney disease, hypothyroidism, diabetes, and infections. The accumulation of cholesterol in arteriosclerotic lesions is not paralleled by an increase in blood cholesterol. The function of cholesterol in metabolism has not been established.
—R. McANALLY.

PARKER, J. E., & MCSPADDEN, B. J. (1943). **Seasonal Variation in Semen Production in Domestic Fowls.**—*Poult. Sci.* **22.** 142–147. **2223**

Collections of semen were made from 12 Rhode Island Red cockerels twice monthly over a period of one year. The mean number of spermatozoa produced per male increased from 1·44 billion in mid-December to 3·49 billion during the latter part of April, after which there was a gradual decline to the middle of July. Sperm production increased slightly during August, but declined during September to November. By the latter part of November, the mean number of sperms ejaculated per male was only 0·26 billion. It would appear, therefore, that spermatogenesis, like egg production, is related to length of day. Sperm concentration and, to a lesser extent, semen volume were also influenced by season. Motility of spermatozoa remained relatively constant throughout the year.—N. J. SCORGIE.

*MARCATO, A. (1941). Il midollo osseo normale nella specie bovina. (Mielogramma, rapporto leucoeritropoietico, curve di maturazione). [**Normal Bone-Marrow in Cattle**].—*Nuova Vet.* **19.** 173–179. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 530]. **2224**

M. reports the relative proportions of the cells in the marrow obtained by sternal puncture of 27 healthy cattle. Averages are given separately for calves, heifers, medium aged and old cows. The accompanying tables give the figures for the four age groups.

I. MYELOGRAM

	Calves	*Heifers*	*Medium-Aged Cows*	*Old Cows*
Erythroblasts ...	3·15	3·35	3·7	3·68
Monoblasts/ Monocytes ...	6·18	8·87	8·35	9·36
Haemocytoblasts	4·0	3·93	4·35	4·1
Promyelocytes neutrophile ...	1·1	1·15	1·4	1·5
eosinophile ...	0·85	1·28	1·5	1·5
Myelocytes neutrophile ...	5·35	5·32	5·6	6·1
eosinophile ...	5·55	5·75	5·0	5 0
Metamyelocytes neutrophile ...	12·15	10·63	11·5	12·1
eosinophile ...	6·85	5·9	6·3	5·27
Proerythroblasts	1·6	2·12	2·3	2·42
Erythroblasts basophile ...	9·55	11·85	11·5	11·95
polychromatophile ...	20·45	18·57	18 0	16·8
orthochromatic	22·9	20·33	19·5	19·0
Megakaryocytes	0·55	0·72	0·5	0·54
Plasmocytes ...	0·5	0·23	0·5	0·68

II. LEUCO-ERYTHROPOIETIC RELATIONSHIP

	Calves	*Heifers*	*Medium-Aged Cows*	*Old Cows*
	0·585	0·61	0·58	0·66

III. MATURATION CURVE

	Calves	*Heifers*	*Medium-Aged Cows*	*Old Cows*
Promyelocytes ...	7 0	9·3	10·0	9·8
Myelocytes ...	32·4	35·5	35·6	35·4
Metamyelocytes	60·6	55·2	54·4	54·8
Proerythroblasts	3 0	4·0	4·5	4·9
Erythroblasts basophile ...	17·6	22·5	22·7	23·5
polychromatophile ...	37·6	35 0	34·5	33·8
orthochromatic	41·8	38·5	38·3	37·8
Mitoses % ...	0·8	0·55	0·75	0·6

—J. G. CARR.

MODES, E. (1939). Zum Vorkommen echter Synovialgrüben (fossae nudatae) bei Mensch, Wiederkäuern und Pferd. [**True Synovial Fossae (Fossae nudatae) in Man, Ruminants, and the Horse**].—*Virchows Arch.* **303.** 603–610. [Abst. in *Brit. Chem. Physiol. Abstr.* March 1942. p. 185, copied *verbatim*. Signed : J. A.] **2225**

In the first stage of the physiological process which leads to thinning and eventually to complete disappearance of the central part of the articular cartilage, approximation of the superficial cartilage cells can be observed. This is due to resorption of the intercellular matrix which extends into the deeper layers of cartilage and the underlying bone until finally the joint cavity communicates with the bone marrow, which often protrudes into the joint, being covered by a double endosteal and perichondral cell layer only. Insufficient pressure in the central part of the articular surface is responsible for this resorptive degenerative process.

HENLE, G., & ZITTLE, C. A. (1942). **Studies of the Metabolism of Bovine Epididymal Spermatozoa.**—*Amer. J. Physiol.* **136.** 70–78. **2226**

The authors found that the oxygen consumption of bovine epididymal spermatozoa, derived from different bulls, and suspended in Ringer solution, varied over a wide range. Several factors were shown to be responsible for this, *viz*, (1) differences in the degree of maturity of samples of sperm obtained from different epididymes, (2) differences in the concentration of spermatozoa, optimal respiration taking place in suspensions containing 400–800 million cells per ml., and (3) differences of pH in the sperm suspensions, highest O_2 consumption occurring at pH 7·5–8·0. Seminal spermatozoa had a decidedly lower O_2 consumption than epididymal spermatozoa. In excessively concentrated suspensions mechanical hindrance of the spermatozoa or insufficient diffusion of O_2 could account for the lower O_2 uptake. An important finding was that the decreased respiration in dilute suspensions of spermatozoa was completely prevented by the addition of cell-free epididymal secretion to the medium. The

factor present in this material was heat stable and not dialysable. The finding of other workers that epididymal spermatozoa showed high aerobic glycolysis in addition to anaerobic glycolysis was confirmed, and it is concluded that there can be no doubt that the glycolysis furnished the major part of energy for spermatozoal activity in the presence of glucose.—N. J. Scorgie.

Menju, K. (1939–40). **An Experimental Study on the Mechanism of the Secretion of Milk. First Report. An Experimental Study on the Physiological Growth of the Mammary Gland. Second Report. An Experimental Study on the Relation between the Pituitary Anterior Lobe and the Mammary Gland. III. The Effect of the Separate and Combined Action of Follicular Hormone, Luteohormone and Anterior Pituitary Hormone on the Mammary Gland. IV. The Relation between the Adrenal and the Mammary Glands.**—*Jap. J. Obstet. Gynec.* **22.** 257–264, 376–386, and **23.** 25–34 & 35–41. [In English]. **2227**

[Absts. of parts III & IV copied *verbatim* from *J. Dairy Sci.* **25.** A73 and A74. Signed: R. E. L. B.]

I. Macroscopic and microscopic studies were made of the mammary glands of rabbits in four stages of development, *viz*, infant, mature virgin, pregnant, and post-parturient animals. In infancy the number of secretory ducts was small but increased as maturity was reached, with a very rapid increase during pregnancy. The vessel walls usually consisted of double layers of epithelium but in the later stages of pregnancy and after parturition, secretory ducts of medium and small size with a single layer of epithelium began to appear and fat became evident within the cells. The amount of interstitial tissue was inversely proportional to the growth of the gland tissue. In infancy the "endapparatus", "endochambers" and glandular lobules were usually absent; in adult virgin rabbits a few "endapparatus" but no "endochambers" were observed. During early pregnancy the secretory ducts, "endapparatus", and glandular lobes developed, but not until the later stage of pregnancy and during puerperium did the "endochambers" show rapid growth.

II. The effect of daily intravenous injections of 20, 50, 100, 200, and 400 rat units of "praehormon" (an anterior pituitary hormone) and of gonadotropin was investigated macroscopically and microscopically in infant female rabbits and ovariectomized rabbits. 20–200 R.U. per day resulted in gradual increase in the growth of the mammary gland in proportion to the dose injected, but 400 R.U. gave no greater response than 200 R.U. The secretory development also increased gradually with the dosage up to 200 R.U. and was extremely vigorous when 400 R.U. daily was given. Injection of either "praehormon" or gonadotropin had a similar effect on the mammary gland development. It is stated that the action of the hormones was chiefly, but not entirely, (as shown by the ovariectomized animals) through the medium of the ovary.

III. Daily subcutaneous injections of 100 I.U. of ovahormone benzoate (follicular hormone) for 21 days markedly accelerated the growth of the mammary glands in immature castrated rabbits; the growth was accelerated still further if 1 "K.E." oophormin (luteohormone) was also injected during the last 6 days. Daily injection of 1,000 I.U. of ovahormone benzoate or of water-soluble ovahormone for 6 or 7 days into puerperal guinea pigs beginning on the first day of the puerperium inhibited lactation; ovahormone benzoate had a greater inhibitory action than water-soluble ovahormone. This inhibitory action apparently originates in the mid-brain. The subcutaneous injection of 1000 I.U. of ovahormone benzoate or of water-soluble ovahormone combined with the intravenous injection of 200 R.U. of gonadotropin daily for 21 days into immature, female, non-castrated rabbits produced a greater acceleration of the growth of the mammary gland than the administration of ovahormone benzoate or water-soluble ovahormone. If the rabbits which had received this treatment for 15 days followed by the administration of water-soluble ovahormone, gonadotropin and oophormin as above for 6 days were castrated 24 hours after the last injection, a marked acceleration of the secretory function appeared 72 hours later. Oophormin is particularly important for the growth of the "endoapparatus" of the mammary gland; it has practically no effect on lactation.

IV. Gradual atrophy of the mammary gland occurred in puerperal guinea pigs which had been separated from their young 2 to 4 hours after delivery; secretion was still active, however, even on the 6th day of the puerperium. Daily subcutaneous injections of 0·5 cc. of 0·1 per cent. adrenaline hydrochloride inhibited lactation. Daily subcutaneous injections of 0·5 or 1·0 cc. interenin (cortical hormone) during the first 5 days of the puerperium inhibited lactation slightly.

Shaw, J. C., & Petersen, W. E. (1943). **The Utilization of β-Hydroxybutyric Acid by the Perfused Lactating Mammary Gland.**—*J. biol. Chem.* **147.** 639–643. **2228**

Bovine mammary glands were perfused with blood to which had been added 2–10 g. of sodium β-hydroxybutyrate, and in which the blood sugar was maintained at, or in excess of, 40 mg. %. In nine experiments the average uptake of β-hydroxybutyric acid by the perfused lactating glands was 2,090 mg. In one balance experiment, 89% of the oxygen consumed could be accounted for by β-hydroxybutyric acid utilization. These findings are discussed in conjunction with similar results previously obtained by arterio-venous differences in the living animal. It is concluded that the bulk of the evidence favours the suggestion that β-hydroxybutyric acid is oxidized by the gland for energy purposes and that the gland of the normal cow also oxidizes other non-carbohydrate substances for energy purposes. [See also Shaw—*V. B.* **13.** 64, and Shaw *et al.*—*V. B.* **13.** 182.]—Alfred T. Cowie.

Meites, J., & Turner, C. W. (1942). **Studies Concerning Mechanism Controlling Initiation of Lactation at Parturition. IV. Influence of Suckling on Lactogen Content of Pituitary of Postpartum Rabbits.**—*Endocrinology.* **31.** 340–344. [For previous parts, see *V. B.* **13.** 257]. **2229**

Fifty-two mature rabbits were allowed to nurse their litters, and 20 had their litters removed at birth. Rabbits from both groups were killed at intervals of 2, 5, 10, and 20 days, and their pituitary glands assayed for lactogen and the mammary glands examined macroscopically. At the second day the lactogen per pituitary was similar in both groups, about 1·0 I.U. At the fifth day the lactogen content reached a peak in both groups, but in the nursing rabbits it averaged 2·70 I.U. compared with 1·62 I.U. in the non-nursing rabbits. By the 20th day the figures were 1·26 I.U. and 0·63 I.U. lactogen per pituitary, *i.e.* in the non-nursing does it had returned to the *ante-partum* level. Mammary secretion was fully established by the fifth day, but there was more milk in the glands of the nursing does; in the non-nursing does the milk declined rapidly from the fifth to the tenth day.

It is concluded that, in the rabbit, maximum lactogen in the pituitary and maximum milk secretion cannot be obtained without the act of nursing.—A. T. C.

Reece, R. P. (1943). **Initiation and Maintenance of Lactation in Dairy Heifers by Hormone Administration.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 145–146. **2230**

Lactation was induced in two sterile heifers by injecting diethylstilboestrol dipropionate twice weekly for a period of three months, the total dosage being 163 mg. and 268 mg. respectively; the first heifer in addition received 60 mg. testosterone propionate. Milking was started after the last injection, but the amount of secretion was small. After the heifers had suckled calves for a few weeks, it was found that the quantity of milk had greatly increased. Five months after the beginning of the treatment the first heifer was averaging 24 lb. milk per day, her peak yield was 27½ lb., and after seven months' lactation, her yield averaged 20 lb. per day. Seven months after the commencement of the treatment this heifer was served and became pregnant. The second heifer averaged 28 lb. of milk per day with a peak yield of 33¾ lb. [See also FOLLEY *et al.*—*V. B.* **12.** 550.]—ALFRED T. COWIE.

BISCHOFF, F., & INGRAHAM, L. P. (1942). **Influence of Antagonism Phenomenon on Mammary Gland Development.**—*Endocrinology.* **31.** 326–328. **2231**

Certain gonadotropin-containing extracts if given in a large dose and in a rapidly absorbable form may antagonize the influence of endogenous gonadotropins, their own influence, or the influence of other gonadotropins. Three groups of eight virgin female mice were injected daily for ten days with sheep pituitary extracts. The first group received the extract in a soluble form given subcutaneously, the second group received the soluble extract intraperitoneally, and the third group received an insoluble preparation subcutaneously; all groups received a total of 4·5 mg. of hormone per mouse. There was a fourth group of eight controls. On the 11th day after the initial dosage, all mice were autopsied. The group receiving the insoluble hormone showed 110% ovarian hypertrophy and marked alveolar development of the mammary gland, indicating that slow absorption produced the greatest effect. The soluble extract of gonadotropin produced 30–50% ovarian hypertrophy and no significant alveolar development. The mammary development is believed to depend on the stimulation of the mammogenic hormones of the pituitary by the increased oestrin and progesterone secretion resulting from the ovarian hypertrophy.

—ALFRED T. COWIE.

TURNER, H. H., LACHMANN, E., & HELLBAUM, A. A. (1941). **Effect of Testosterone Propionate on Bone Growth and Skeletal Maturation of Normal and Castrated Male Rats.**—*Endocrinology.* **29.** 425–429. **2232**

Eighty-six rats in six groups were treated with testosterone propionate under varying conditions and were compared with 30 control rats. An analysis of the results showed that prolonged injections of large amounts of testosterone (up to 2 mg. per day) had no effect on skeletal maturation or body growth in rats. In the early stages, however, the appearance of the os penis and of the epiphyses for the ischial tuberosities was hastened, but after 87 days there was no difference between the control and the treated rats, whether castrated and intact.—F. AYLWARD.

ACKERKNECHT, E. (1938). Anatomie für den Tierarzt. Vorwort. **[Anatomy for the Veterinary Surgeon. Introduction].**—*Dtsch. tierärztl. Wschr.* **46.** 146. **2233**

MÜLLER, F. (1938). Anatomie für den Tierarzt. I. Beitrag. Von der Lunge. **[Anatomy for the Veterinary Surgeon. I. The Lungs].**—*Ibid.* 146–153. **2234**

SCHWARZE, E. (1939). III. Beitrag zur "Anatomie für den Tierarzt". Hoden und Nebenhoden. **[Anatomy for the Veterinary Surgeon. III. Testis and Epididymis].**—*Ibid.* **47.** 291–298. **2235**

STEGER, G. (1939). IV. Beitrag zur "Anatomie für den Tierarzt". Die tierartlichen Merkmale der Haussäugermilzen bezüglich Form, Hilus, und Gefässen. **[Anatomy for the Veterinary Surgeon. IV. Comparison of the Spleen of Domestic Mammals Relative to Form, Hilus and Vessels].**—*Ibid.* 325–327. **2236**

SCHWARZE, E. (1939). V. Beitrag zur "Anatomie für den Tierarzt". Von den Nieren. **[Anatomy for the Veterinary Surgeon. V. The Kidneys].**—*Ibid.* **47.** 709–715. **2237**

ACKERKNECHT, E. (1941). VI. Beitrag zur "Anatomie für den Tierarzt". Der Säugetierherz-Mechanismus. **[Anatomy for the Veterinary Surgeon. VI. Mechanism of the Mammalian Heart].**—*Ibid.* **49.** 301–307. **2238**

SCHWARZE, E. (1941). VII. Beitrag zur "Anatomie für den Tierarzt". Von den Nebennieren. **[Anatomy for the Veterinary Surgeon. VII. The Adrenal Glands].**—*Ibid.* 601–609. **2239**

[See also abst. following].

These articles are post-graduate studies on selected anatomical regions and are accompanied by excellent line drawings. They require study in the original. The series is introduced by A.

I. M. describes the topography of the lungs of the horse, ox, sheep, goat, pig, dog, cat, rabbit, and g. pig.

II. For part II of this series, see STEGER—*V. B.* **9.** 431.

III. This concerns the physiology as well as the macroscopic anatomy of the testis and epididymis of the above domestic animals.

IV. This concerns the macroscopic anatomy of the spleen in the above animals.

V. This part deals with the kidneys, both as to naked-eye and semi-microscopic structure, the latter presented diagrammatically in large figures, in the above animals.

VI. The structure and mechanism of the mammalian heart is dealt with, without special reference to the specific domestic animals.

VII. The adrenal glands their anatomy in the animals listed above, and their structure on a diagramatic basis are described.—J. E.

SEIFERLE, E. (1942). VIII. Beitrag zur "Anatomie für den Tierarzt". Bauplan und Arbeitsweise des Säuger-Eierstockes. **[Anatomy for the Veterinary Surgeon. VIII. Structure and Function of the Mammalian Ovary].**—*Dtsch. tierärztl. Wschr.* **50.** 201–205. [See also preceding series of absts.] **2240**

S. reviews in full the general anatomy and function of the mammalian ovary. The development of the Graafian follicle from early stages to maturation is described; it is emphasized that several types of specialized ovarian cells are responsible for its growth from the primary to the tertiary follicular stage and that any irregularity in their activity will result in atrophy. It is only after the third stage that the follicle comes under the stimulus of the anterior pituitary hormone. The number, speed of growth, and position on the surface of the mature follicles varies in the mammalian ovary. It is not considered that the muscular layer in the region of the hilus is in any way connected with rupture of the follicle or expulsion of the ovum. S. deprecates the use of the word "gland" in descriptions of the ovary, and gives reasons for this.—C. W. O.

See also absts. **2298**, **2299** (blood), **2194** (fertility).

POISONS AND POISONING

*Johansson, A. (1942). Fall av zinkförgiftning hos nöt till följd av svetsningsarbete i ladugård. [**Zinc Poisoning in Cattle**].—*Svensk VetTidskr.* p. 163. [Abst. from abst. in *Skand. VetTidskr.* **32.** 640]. **2241**

Two severe and two mild cases of zinc poisoning occurred in a herd of cows in a byre in or near which galvanized iron pipes were being fitted by welding. Symptoms were fever, dyspnoea, anorexia, suppression of milk yield, and subcutaneous emphysema of the neck and chest. Recovery ensued in a few days.

This type of poisoning is said to be due to the inhalation of zinc oxide vapour which is formed as a white smoke during welding of galvanized iron. The ZnO in the lungs causes a shock-like syndrome, in which the lung epithelium becomes damaged, allowing air to penetrate into the connective tissue and thence to extend to the chest wall.—J. E.

*Lüth, K. H. (1942). Ueber Flussäurevergiftungen beim Rindvieh in Seelze. [**Fluorine Poisoning in Cattle**].—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 451]. **2242**

Almost all the cattle in the Seelze area showed evidence of injury. Of 97 animals examined, 90 were affected with chronic fluorine poisoning; of these, 22 had had acute symptoms for about six months and 12 had to be slaughtered. An important cattle-breeding industry in the affected area has been almost destroyed due to the injurious effects of the waste gases containing F from a neighbouring chemical works. Preventive measures are discussed.

Three characteristic forms of F poisoning may be recognized, *viz*, the acute form which produces difficulty of movement within a few days and leads to painful paralysis, the chronic form with clinically demonstrable changes in the bones and teeth, and the chronic form with no obvious bone lesions but with some changes in the teeth.—A. M. Copping.

Ranganathan, S. (1941). **Calcium Intake and Fluorine Poisoning in Rats.**—*Indian J. med. Res.* **29.** 693–697. **2243**

In experiments on growing rats, sodium fluoride, fed at a level of about 1 mg. per rat per day, had no harmful effect on growth or survival, even when the diet contained as little as 0·1% calcium. With increasing fluoride ingestion, however, the survival period of the rats correspondingly decreased. Calcium, administered as a salt or present in combination in natural foodstuffs, exerted a mitigating influence on F poisoning in rats. At the levels of dosage used, the toxic effect of F was inversely proportional to the Ca intake. A change in the P intake was without influence.—B. N. Majumdar.

Byers, H. G., Miller, J. T., Williams, K. T., & Lakin, H. W. (1938). **Selenium Occurrence in Certain Soils in the United States with a Discussion of Related Topics. Third Report.**—*Tech. Bull. U.S. Dep. Agric.* No. 601. pp. 74. [For first report, see *V. B.* **6.** 12; for second report, see *Tech. Bull. U.S. Dep. Agric.* No. 530. pp. 79. (1936)]. **2244**

The results are reported of a survey of parts of a number of states in the U.S.A., which established the existence of seleniferous areas in those states. Also data are given on Se in water, sources of Se in soil, origin of Se concentration, forms of Se in the soil, irrigation in Se areas, relation between Se content of soil and of vegetation, methods of examination of soils, and changes in survey methods.—R. Allcroft.

Trelease, S. F., Greenfield, S. S., & DiSomma, A. A. (1942). **Absorption of Selenium by Corn from Astragalus Extracts and Solutions Containing Proteins.**—*Science.* **96.** 234–235. **2245**

Besides being highly toxic to livestock, selenium indicator plants act as converters of Se by absorbing it from the soil and converting it to water-soluble forms which are much more readily absorbed than Se from an inorganic compound such as sodium selenite. It was found that corn seedlings grown in solution cultures absorbed 10–20 times more Se from a watery extract of the indicator plant, *Astragalus bisulcatus*, than when Se was added in the form of Na_2SeO_3. It was also found that the absorption of Se from Na_2SeO_3 was increased when proteins and protein derivatives and amino acids were added to the culture solution. Water extracts of alfalfa hay and of string beans also increased Se absorption. It is suggested that soils naturally high in humus may allow a greater absorption of Se by crops than soils low in such substances.—G. D. S.

Blakemore, F., & Shearer, G. D. (1943). **The Poisoning of Livestock by Cacao Products.**—*Vet. Rec.* **55.** 165. **2246**

In a preliminary feeding trial, three fowls were allowed to consume an unlimited amount of meal containing 0·5% theobromine. One bird died within 48 hours while the other two remained normal. A discussion of the analyses of some samples of cocoa meal and also the evidence regarding the toxicity of these products is given.—J. C. Buxton.

Black, D. J. G., & Barron, N. S. (1943). **Observations on the Feeding of a Cacao Waste Product to Poultry.**—*Vet. Rec.* **55.** 166–167. **2247**

Inexplicable losses amongst a large flock of poultry were thought to be due to the inclusion in the rations of cacao preparations and a small feeding trial was carried out in which three groups each of three birds received from 7·5 to 30% of cacao shell preparations with results which indicated their toxic nature. The feeding of 15% and upwards of this material was extremely harmful, while the use of 7·5% cannot be regarded as safe.—J. C. Buxton.

Temperton, H., & Shaw, I. G. (1943). **The Toxic Principle in Cocoa Wastes.**—*Harper Adams Util. Poult. J.* **28.** 15–17. **2248**

This paper is an account of an experiment designed to determine the constituent responsible for deaths in poultry when cocoa waste products are included in their rations. Attention is drawn to the work of Mueller (1942) who concluded that the toxic nature of cocoa waste is due more to tannic substances than to theobromine.

The authors fed to four groups, each comprising two birds, 5 oz. per head daily of mash with the addition of a small quantity of pure theobromine in capsule form to two groups (0·2 and 0·4 g. theobromine respectively), 0·2 g. theobromine and 1·86 g. catechu (containing 30% tannin) to another group, and catechu only to the fourth group. The tabulated results show clearly that deaths occurred amongst birds receiving theobromine, whereas none occurred in the group which received only tannin. The length of time which ensued before some of the birds died under this experiment lends strength to the assumption that the effects of theobromine in small doses are cumulative.—J. C. Buxton.

Puissegur, J. A. (1942). Una enfermedad poco frecuente: el ergotismo. Importancia de la inspección veterinaria de la carne y la leche provenientes de animales atacados por dicha enfermedad. [**Ergotism in Cattle**].—*Rev. Med. vet., B. Aires.* **24.** 540–543. **2249**

P. reports the occurrence of ergotism in some dairy cattle which were pastured on rye badly affected with *Claviceps purpurea*. The symptoms were :– temperature a little below normal, difficult breathing, cyanosis or yellowish colouring of the mucosae, weak pulse, dilated pupil, muscular tremors, colic, diarrhoea, and abortion.

He suggests that a period of six months should be allowed after cure of ergotism before the milk or flesh of affected bovines is used for human consumption. [No evidence is given as to the danger of poisoning if the tissues of affected cattle are consumed by human beings.—Ed.]—Miller Watson.

See also absts. **2088** (mouldy fodder poisoning), **2167** (neurofibromas from ergot), **2197, 2198** (goitrogenicity of foods), **2289** (rat poisons), **2266** (toxicity of insecticides), **2275** (carbon tetrachloride poisoning).

THERAPEUTICS AND DISINFECTION

Bradbury, F. R., & Jordan, D. O. (1942). **The Surface Behaviour of Antibacterial Substances. 1. Sulphanilamide and Related Substances.**—*Biochem. J.* **36.** 287–293. **2250**

The electro-kinetic mobility of *Bacterium coli* suspensions in dilute aqueous solutions of sulphanilamide, *p*-aminobenzoic acid, and chemically related compounds was determined, an improved all-glass cataphoretic cell being used. In contrast to the inactive substances, which produced an initial change in mobility unaltered subsequently by time of contact, antibacterial substances and *p*-aminobenzoic acid affected the bacterial mobility in a manner which varied with the time of contact, the variability being characterized by the formation of two well defined maxima in the mobility-time curve. This observation is taken to indicate that the antibacterial substances behave in a similar manner to *p*-aminobenzoic acid at the surface of the bacterial cells, and a comparison of the bacterial mobility changes produced by sulphanilamide, benzenesulphonamide, and aniline hydrochloride leads the authors to conclude that the association of drug with organism is a function of the $-NH_2$ groups, and that the polarity produced by the resonance of active molecules is one of the factors determining antibacterial activity.—J. L. McGirr.

McKee, C. M., & Rake, G. (1942). **Activity of Penicillin Against Strains of Pneumococci Resistant to Sulfonamide Drugs.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 275–278. **2251**

Four strains of pneumococci naturally resistant to sulphonamides were shown by mouse protection tests to be readily susceptible to penicillin. When infection and treatment were both given intraperitoneally, a single dose of 1 Florey unit protected 84% and a dose of 10 Florey units protected 95% of the treated mice, suggesting that penicillin exerts a bactericidal as well as a bacteriostatic action. When infection was introduced intraperitoneally and penicillin given subcutaneously, a single dose of 10 Florey units protected 35% and a dose of 100 Florey units protected 100% of the treated mice. Attempts to produce penicillin-resistant strains showed that after growth in penicillin broth for a short time, cultures were resistant to twice the previously inhibitory concentration, but no difference in resistance was observed when the cultures were tested in mice.—R. Allcroft.

Rammelkamp, C. H., & Maxon, T. (1942). **Resistance of *Staphylococcus aureus* to the Action of Penicillin.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 386–389. **2252**

It was found that all of 29 strains of *Staph. aureus* were killed in concentrations of penicillin between 0·02 and 0·35 Florey units per ml. of broth, thus indicating that different strains of staphylococci vary only slightly in their resistance to penicillin. *In vitro* it was demonstrated in two strains that by growing the organism in increasing concentrations of penicillin over a long period it was possible to render it resistant to penicillin, but a strain of haemolytic streptococcus exposed to penicillin for a period of 45 days did not become " penicillin-fast ". Observations made on 14 patients during the course of penicillin therapy showed that in four cases increased resistance to penicillin developed in the four strains of staphylococci isolated.—R. Allcroft.

Clapp, M. P. (1942). ***In vitro* Effect of Tyrothricin and Tyrocidine Hydrochloride on Polymorphonuclear Leucocytes.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 279–281. **2253**

In high concentrations tyrothricin and tyrocidine hydrochloride caused cytoplasmic and nuclear disintegration ; in lower concentrations altered staining reactions were observed. When there was no apparent microscopic injury to the cells; phagocytosis of pneumococci occurred as expected. It was observed that the presence of serum afforded some protection for the cells from the effects of tyrothricin and tyrocidine.—R. A.

Bryan, C. S., Weldy, M. L., & Greenberg, J. (1942). **The Results Obtained with Tyrothricin in the Treatment of 157 Cows with Streptococcic Mastitis.**—*Vet. Med.* **37.** 364–369. **2254**

Of 157 cows affected with streptococcal mastitis 142 (90%) were cured after treatment with tyrothricin ; the dose employed was 150 mg. for each quarter. In 105 animals the treatment was successful after one infusion, in 25 cows a favourable response occurred after two infusions, while ten cows failed to respond to treatment. The degree of induration present but not the previous duration of the infection, influenced the effectiveness of the treatment. In the majority of the cows there was a fall in the milk yield from 1–50% ; in six cows this reduction in yield was between 50 and 90%. In all animals the milk production returned to normal within 21 days. 57 or 78% of 73 cows produced abnormal milk for less than five days while the remaining 22% continued to produce abnormal milk for 5–14 days. The assessment of infection and cure was made by the microscopic examination of incubated milk samples. —D. L. Hughes.

Millar, J. A. S. (1943). **The Sulfonamids—Therapy in Practice.**—*J. Amer. vet. med. Ass.* **102.** 51–56. **2255**

M. discusses briefly the mode of action of the sulphonamides and their toxic effects, the uses of the various drugs in the individual domestic animals, and special clinical uses of the drugs. No new work is recorded.—J. A. Griffiths.

Bryan, A. H. (1943). **" Sulfasuxidine " Succinylsulfathiazole in Veterinary Practice.**—*J. Amer. vet. med. Ass.* **102.** 22–26. **2256**

B. reports the results of succinylsulphathiazole therapy in dogs and cats with specific or unspecific types of diarrhoea and enteritis. Dosage was 0·25–0·5 g. per kg. body weight per day in 4–6 fractional doses. Thirteen canine and four feline case records are given. It is concluded that the drug is non-toxic and is particularly effective in the " bacilliary dysenteries " [presumably a clinical term : meaning not clear] of the dog and cat. Large doses may be given as the drug is not readily absorbed into the bloodstream.—J. A. G.

SCHMIDT, L. H., & SESLER, C. L. (1943). **Sulfapyrazine: Its Activity against Experimental Infections with Beta Hemolytic Streptococci as Compared with that of Sulfadiazine, Sulfathiazole, Sulfapyridine and Sulfanilamide.**—*J. Pharmacol.* **77.** 277–289. 2257

Sulphapyrazine is about as effective as sulphadiazine against infections with various strains of β haemolytic streptococci, and more effective than similar doses of sulphathiazole, sulphapyridine and sulphanilamide. The activities of all five drugs are essentially identical when the average concentrations in the blood are the same. The superior activity of sulphapyrazine and sulphadiazine in streptococcal infections as compared with equal doses of the other sulphonamides is probably due to the absorption and excretion characteristics of the two drugs that make possible the maintenance of effective concentrations in the blood at all times between treatments.—J. M. ROBSON.

ROSE, F. L., MARTIN, A. R., & BEVAN, H. G. L. (1943). **Sulphamethazine (2 - 4′ - Aminobenzenesulphonyl - amino-4 : 6-Dimethylpyrimidine) a New Heterocyclic Derivative of Sulphanilamide.**—*J. Pharmacol.* **77.** 127–142. 2258

Sulphamethazine is more soluble in water than sulphathiazole, sulphadiazine and sulphapyridine over a pH range of 5·5–8·0. The acetyl derivative of sulphamethazine is more soluble than the corresponding derivatives of sulphapyridine and sulphathiazole (at pH 4·5–8·0). At pH 7·5–8·0, acetyl sulphadiazine is more soluble than acetyl sulphamethazine, but is slightly less soluble between pH 4·5 and 7·0. In experimental infections of mice with haemolytic streptococci and pneumococci, sulphapyridine and sulphamethazine gave very similar results. Sulphamethazine is very rapidly absorbed from the intestinal tract and is more slowly excreted than either sulphanilamide or sulphapyridine. The toxicity of these compounds in mice is about the same, but the acetyl derivative of sulphamethazine is less toxic than are the acetyl derivatives of the other two compounds. Results in man show that sulphamethazine is freely and rapidly absorbed, and does not produce toxic symptoms or renal complications even when given in large doses.—J. M. ROBSON.

FEINSTONE, W. H. (1942). **A Method for Studies in Chemotherapy of Tuberculosis. The Use of a Piscine Infection.**—*Amer. Rev. Tuberc.* **46.** 101–104. [Spanish summary]. 2259

This investigation was initiated in an attempt to evolve an economical method for testing the chemotherapeutic efficacy of new synthetic compounds (generally available only in small amounts) against experimental TB.

Goldfish were infected intraperitoneally with *Mycobacterium marinum* and placed in water-tanks containing sulphanilamide and sulphaguanidine in concentrations of 10 mg. %. Chemical analyses indicated that the drug concentration of the tissues of the fish reached an equilibrium with that of the water. Three weeks after infection, the numbers of acid-fast organisms present in the tissues of treated fish were compared with those present in untreated controls. No significant results were obtained with sulphaguanidine, but with sulphanilamide treatment the number of acid-fast organisms present was appreciably reduced.

—J. LOCHIEL MCGIRR.

DE CANDOLE, C. A. (1943). **The Treatment of Certain Carriers with Sulphaguanidine.**—*J. R. Army med. Cps.* **80.** 220–222. [Author's conclusions copied *verbatim*]. 2260

Sulphaguanidine, in the dosage stated, appears to have been successful in eliminating dysenteric organisms of various types from five chronic carriers but to have failed to do so in the case of a carrier of *Salmonella morbificans bovis*. [All these cases were in human beings.]

METZGER, H. J., WAKSMAN, S. A., & PUGH, L. H. (1942). *In vivo* **Activity of Streptothricin against** *Brucella abortus*.—*Proc. Soc. exp. Biol., N.Y.* **51.** 251–252. 2261

The activity of streptothricin, an antibacterial substance isolated from a soil *Actinomyces* by WAKSMAN and WOODRUFF [see *V. B.* **12.** 510.], was tested *in vivo* against *Brucella abortus* by using 15-day incubated eggs inoculated in the chorio-allantoic membrane. The results showed that 10 mg. crude streptothricin, administered 24 hours after the inoculation of the eggs with *Br. abortus*, completely destroyed the organism. Further experiments with g. pigs given infective doses of *Br. abortus* were carried out in which streptothricin was administered subcutaneously and intraperitoneally at regular intervals over periods of three and four weeks. The blood serum of treated animals showed no agglutinins in dilutions of 1 : 12·5 and 1 : 25, whereas that of untreated controls agglutinated completely in dilutions of 1 : 25–1 : 400. In one group no organisms were recovered from treated animals but in another, although *Br. abortus* was recovered from the spleens of both treated and untreated animals there was a much greater concentration of organisms in the untreated controls than in the treated animals.—R. ALLCROFT.

ROSENTHAL, S. M. (1943). **The Bacteriostatic Action of Sulfonamide Compounds upon Clostridia.**—*Publ. Hlth Rep., Wash.* **58.** 5–9. [Author's summary copied *verbatim*]. 2262

The commonly employed sulfonamide compounds showed little bacteriostatic action against five or six species of clostridia. Only *Cl. septique* showed appreciable inhibition by compounds of this class.

Nitro derivatives of sulfanilamide, sulfathiazol, sulfapyridine, and 4,4′-diaminodiphenylsulfone were many times more active against these clostridia, although not more active against a hemolytic streptococcus.

The mechanism of action in the nitro compounds differs from that of sulfanilamide in that no antagonism is obtained with p-aminobenzoic acid. Also different from sulfanilamide is an elevation of the redox potential of the medium.

Further study seems indicated to obtain sulfonamides more active against clostridia infections.

ROSENTHAL, S. M. (1942). **The Trypanocidal Action of *3* - Amino - *4* - Hydroxyphenyl Arsenious Oxide ("Mapharsen") Administered Orally with Glutathione.**—*J. Pharmacol.* **76.** 358–362. 2263

It is known that concurrent administration of excess glutathione lowers the toxicity of trivalent arsenious oxides when these are given intravenously, and also inhibits their local irritant action. Glutathione was therefore mixed with the 3-amino-4-hydroxyphenyl arsenious oxide ("Marpharsen" or "Aso") which, in these experiments, was administered orally to mice experimentally infected with *Trypanosoma equiperdum*. It was found that for mice the maximum single tolerated oral dose of 0·15 g. of "Aso" per kg. body weight, was increased to 0·5 g. per kg. when the drug was mixed with 2 mols of glutathione, and to more than 1·0 g. per kg. when 5 mols (6·5 g. per kg.) of glutathione were added. The single curative dose of "Aso" administered orally, which was shown to be 0·04 g. per kg. body weight, was not appreciably altered by admixture with 2 mols of glutathione ; 5 mols, however, caused some interference, and curative effects under these conditions were not obtained until doses of

0·06–0·08 g. per kg. body weight were reached. Preliminary experiments demonstrated that "Aso" also possesses some therapeutic activity in rabbit syphilis.
—D. G. Davey.

*Stöhr, P. (1941). Die Wirkung der Lebertranbehandlung bei Maul- und Klauenseuche. [**Action of Cod Liver Oil in Foot and Mouth Disease**].—*Inaug. Diss., Leipzig.* pp. 19. [*Abst. from abst.* in *Jber. Vet.-Med.* **70.** 22]. **2264**

Experiments on g. pigs showed that cod liver oil had a viricidal action upon F. & M. virus *in vitro*. Treatment of lesions of the feet with a salve of the oil as recommended by Götze [*V. B.* **10.** 837.] was advantageous, but had no effect upon lesions in the mouth.—J. G. Carr.

Simoni, F. (1942). Ricerche sullo scarso valore terapeutico dei sulfamidici nella c. d. laringo-tracheite infettiva dei polli. [**Failure of a Sulphonamide "Tioseptale" to Cure Avian Laryngotracheitis**].—*Nuova Vet.* **20.** 212–214. **2265**

The course of the disease was unaffected in fowls, artificially infected with laryngotracheitis and treated with "Tioseptale", a soluble sulphonamide.—M. W.

Shepard, H. H. (1942). **The Chemistry of Toxicology of Insecticides.** pp. iii+383. Minneapolis, Minn.: Burgess Publishing Co. [4to]. **2266**

The subject matter of this mimeographed volume, which is concerned mainly with insect toxicology in relation to agriculture, is presented in 11 chapters under the following headings: Introduction, History of Insecticides, Principles of Insecticide Toxicology, Quantitative Toxicology of Insecticides, Arsenical Stomach Poisons, Non-Arsenical Stomach Poisons, Contact Insecticides I (Sulphur and Copper Compounds), Contact Insecticides II (Adjuvants: Oils and their Derivatives), Plant Derivatives and Related Compounds, Insect Fumigants, and Miscellaneous Chemical Control. Each chapter is accompanied by a bibliography. In addition to data on the physical, chemical, and toxicological aspects of the fats and theories relative to insecticides, information is presented regarding the history and commerce pertaining to this field. It is pointed out that while the text is not merely an annotated bibliography, it is primarily a guide to insecticide literature. Methods of insect control are not given apart from various illustrations explaining the action of specific insecticides.

A considerable amount of incidental information of relatively direct interest to the veterinarian is given, *e.g.* toxicity data on arsenic and fluorine compounds for man and animals; a brief review of the literature on acute and chronic lead poisoning in man and animals, notes on the toxic action of nicotine and related substances on the mammalian organism, and a brief review of information on the toxicology and chemistry of derris and rotenoid compounds.—J. Lochiel McGirr.

Telford, H. S., Longwell, J. H., & Munro, J. A. (1943). **Phenothiazine for Cattle Lice Control.**—*Science.* **97.** 354. **2267**

A dust consisting of equal parts of phenothiazine and white flour was effective against the sucking lice of cattle, *Haematopinus eurysternus* and *Linognathus vituli*, but not against the biting louse, *Bovicola bovis*. Addition to the dust of an equal quantity of sodium fluosilicate rendered the mixture effective against all three species. It is suggested that such a mixture might with advantage replace dusts containing rotenone or pyrethrins, which are in short supply.—E. S.

Lewis, E. A. (1943). **Emergency Dips for Cattle Ticks.**—*E. Afr. agric. J.* **8.** 171–173. **2268**

This paper describes the preparation and use of two home-made arsenical dips for the destruction of cattle ticks.

The formulae of the dips are based upon the recommendations of the United States Department of Agriculture [Farmers' Bulletin No. 1057 (1932)], but use is made of materials produced or readily available in East Africa.—W. Moore.

Clayton, T. M. (1943). **Treatment of Scabies by T.E.T.M.S.**—*Brit. med. J.* April 10th. 443–445. **2269**

A 25% emulsion of tetraethylthiuram monosulphide (T.E.T.M.S.) cured 11 out of 14 cases of complicated scabies, the remaining three cases probably being reinfestations. A 5% solution proved curative in 93 consecutive cases. A mild dermatitis was produced in seven of the 93 cases treated with the 5% solution, but in 33 cases treated with the 25% emulsion, no dermatitis or irritation occurred beyond a preliminary smarting in some severe cases.—W. Moore.

Mönnig, H. O. (1942). **Control of Worms in Sheep.**—*Fmg S. Afr.* **17.** 455–458. **2270**

Emphasis is laid on the necessity for paying less attention to remedies and more to preventive measures such as good feeding, lambing at correct times, rotational grazing, etc., and it is stated that 75% of the worm menace could be removed by the application of these measures. A calendar for the sheep farmer is given, with hints as to the use of the various remedies for the common types of worms found in sheep. It is emphasized that the continued use of a single remedy which does not kill all types of worms is unsatisfactory.
—E. M. Robinson.

Oelkers, H. A., & Rathje, W. (1941). Zur Wirkungsweise der Anthelminthica. [**Mode of Action of Anthelmintics**].—*Arch. exp. Path. Pharmak.* **198.** 317–337. **2271**

Various substances commonly or occasionally used as anthelmintics were tested for their action *in vitro* on living *Enchytraeus albus* (an oligochaete worm), living *Ascaris lumbricoides*, preparations of leech muscles with or without nerve, and denervated earthworm. Their toxicity to white mice and isolated frog heart was also investigated. The results are expressed in minimum effective concentrations, and are given in lengthy tables.

In general, there was a correlation between the effects of the drugs on the muscle and nerve-muscle preparations (stimulation with or without subsequent paralysis) and their toxic effects on the living worms. There were, however, several exceptions to this.

[A large amount of data is presented in this paper, but their bearing on the question of the mode of action of anthelmintics is not made clear.]—D. G. Gilmour.

*Krauss, F. (1942). Wurmmittel und Wurmabtreibeverfahren in der Volksmedizin inst und jetzt. (Im Anhang: Versuche mit Götterbaumrinde). [**Anthelmintics in Folk Medicine Past and Present. (Tests of *Ailanthus glandulosus* Bark)**].—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 452]. **2272**

On the basis of some indications in old veterinary and medical writings, K. tested the dried and pulverized bark of *A. glandulosus* (the Tree of Heaven) as an anthelmintic. It paralysed and finally killed *Taenia marginata in vitro*, but was useless *in vivo* because it was vomited by the infested dog. Against *Hymenolepis* in white mice and *Moniezia* in sheep it was only slightly effective. It did not affect the stomach or intestinal nematodes of sheep.—D. G. Gilmour.

Naik, R. N. (1942). **Experiment on the Control of Nasal Granuloma.**—*Indian J. vet. Sci.* **12.** 150–159. **2273**

In the districts of Dharwar, Belgaum, and North

Kanara and in Raver taluka, 10–20% of the cattle have nasal granuloma due to *Schistosoma nasalis* infestation. Tartar emetic was found to be superior to antimosan in treatment. Intravenous injection of 1·5 grains per 100 lb. body weight for six consecutive days cured 81·8% of treated cases. At the same time, copper sulphate was used to kill snails in ponds in the area. N. recommends repetition of treatment in obstinate cases and the destruction of the snails every year during monsoon.—G. D. Bhalerao.

*Hennaux, L. (1942). Essai de vitaminotherapie dans un cas de paralysie du poussin. **[Vitamin Therapy of Fowl Paralysis]**.—*Ann. Méd. vét.* p. 129. [Abst. from abst. in *Skand. VetTidskr.* **32.** 838]. **2274**

In the spring of 1932 and again in 1940 there occurred in the same poultry farm a disease in chicks of 3–6 weeks old, characterized by leg weakness with inability to stand up, movement by progression on the metatarsus, and in more severe cases complete paralysis and death.

Small groups of affected chicks were given vitamins A, B_1, or E. Those given vitamins B_1 or E recovered in a few days. The feeding of dried yeast and greenstuff resulted in disappearance of the disease in the flock.

Forbes, J. C., Leach, B. E., & Williams, G. Z. (1942). **Protective Action of Sulfanilamide Against Liver Cirrhosis from Chronic Poisoning with Carbon Tetrachloride.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 47–48. **2275**

It had previously been reported that prophylactic oral administration of certain sulphonamides reduced the mortality rate in rats exposed to CCl_4 inhalation of a degree sufficient to provoke acute poisoning [see Leach *et al.*—*V. B.* **12.** 395]. In the experiments now reported, 7·5–15 mg. of sulphanilamide per 100 g. body weight was administered by stomach tube daily three hours before exposure to CCl_4. The severity of the resultant hepatic lesions and the mortality rate were considerably reduced in comparison with untreated controls. The beneficial effects of dosage with sulphanilamide were not affected by simultaneous administration of *p*-aminobenzoic acid.—Alastair N. Worden.

Henderson, J. L. (1943). **Sulphaguanidine in Neonatal Epidemic Gastro-Enteritis.**—*Brit. med. J.* April 3rd. 410–413. **2276**

In the three years preceding the beginning of this work, the mortality in this disease was above 70% (in 72 cases). After the introduction of sulphaguanidine, the mortality fell to 10% (30 cases). It is pointed out that adequate dosage is important; mature infants received an initial dose of 0·75 g. followed by 0·5 g. at four-hourly intervals. An ample fluid intake must be ensured and fluid every 1½ hours is recommended. Milk should be withheld entirely until the appetite returns, and reintroduced very gradually.—J. M. Robson.

Barke, A. (1942). **Zur Pharmakologie des Kollapses. [Pharmacology of Shock].**—*Dtsch. tierärztl. Wschr.* **50.** 422–427. **2277**

A general discussion of "shock" and indications for its treatment with a variety of agents ranging from strychnine, caffeine, and lobeline to cardiazol and benzedrine. A proprietary preparation "Panalept" has recently been used in veterinary practice for preventing fall of blood pressure during narcosis and also for waking animals from too prolonged narcosis. "Panalept" contains benzedrine (100 mg.), strychnine (2 mg.), and adrenalin (0·5 mg.).—E. G. White.

Mazzotti, L., & Osorio, M. T. (1941). Sobre la presencia de huevecillos de *Fasciola hepatica* en los extractos biliares medicinales. Su significación en el diagnóstico coprológico. **[Eggs of *F. hepatica* in Medicinal Ox Bile]**.—*Rev. Inst. Salubr. Enfermedad. Trop.* **2.** 355–361. [English summary]. **2278**

The authors examined 30 samples of medicinal extract of ox bile purchased in pharmacies in Mexico City. In ten of them they found eggs of *F. hepatica* in small numbers.

Very large doses of the affected products were given to human hospital patients and faecal examinations were carried out. The authors conclude that eggs of *F. hepatica* were never present in the ox bile in sufficient numbers to complicate faecal examinations, or lead to a wrong diagnosis.—Miller Watson.

LeGalley, D. P., & Patterson, G. W. (1940). **The Action of High Frequency Sound Waves on Bacteria.**—*Amer. J. Pharm.* **112.** 373–377. [Abst. from abst. in *Analyst.* **66.** 79]. **2279**

The effect of high frequency sound waves in the high audible region (8,900 cycles) was investigated on suspensions of bacteria. Standard cultures of *Staphylococcus aureus*, after irradiation with high frequency vibrations for 1–5 hours, showed growth when transplanted to beef-extract broth and incubated for 24 hours. In many other experiments made with the same organism, when counts were made only at the beginning and the end of irradiation, a definite mortality among the organisms was observed, but sterility was not attained in any instance. The mortality rate was found to vary exponentially with the time. Microscopic examination of the treated bacteria showed that they were very irregular in shape and size. Similar results were obtained for *Bacterium coli* and *Bacillus subtilis*, except that the results indicated a lower rate of mortality for *Bact. coli*. After irradiation of a suspension of *B. subtilis* for 20 min., the number of bacteria per ml. was reduced from 648,000 to 3,000.—R. Allcroft.

See also absts. **2095** (therapy of avian coccidiosis), **2114** (of Borna disease), **2116** (of equine encephalomyelitis), **2159** (of bovine papilloma), **2178** (of equine colic), **2305** (fractures), **2102**, **2104** (F. & M. disease), **2168** (diet and cancer), **2288** (insecticides).

HYGIENE AND PUBLIC HEALTH

Mello, A., & Rogick, F. A. (1940). A flora colibacilar do queijo tipo Minas e toxi-infecção alimentar. Pesquisas do grupo *Escherichia-Aerobacter*, do *M. tuberculosis* e do gênro *Brucella*. **[The Coliform Flora of Minas Cheese and its Relation to Alimentary Infections. Study of the *Escherichia-Aerobacter* Group, *Mycobacterium tuberculosis*, and the Genus *Brucella*]**.—*Rev. Indústr. Anim.* **3.** 34–46. [Abst. from abst. in *Dairy Sci. Abstr.* **4.** 183]. **2280**

No tubercle bacilli and no *Br. abortus* were found in 30 Minas cheeses examined bacteriologically. These cheeses are made from raw milk.

*Sollazzo, G., & Petrini, M. (1941). Ricerche sulla presenza del bacillo tubercolare nel latte vaccino. **[Tubercle Bacilli in Milk (in Northern Italy)]**.—*G. Batt. Immun.* **26.** 379–404. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 115]. **2281**

Tubercle bacilli were not found in 16 tests on pooled milk from 609 cows of the Milan district, in 46 tests on milk from farms of the Lecco district, nor in ten tests on milk obtained from commercial sources in Lecco. Tests of the milk from 12 cows with thoracic TB. were also negative. In one cow with generalized TB. and a diseased udder, the milk contained tubercle bacilli.

The authors conclude that the danger of dissemination of TB. by milk has been overestimated. [The basis for this deduction is not clear from the abstract.]

—J. G. Carr.

ROBINSON, F. H., & EVANS, A. C. (1939). **Chronic Brucellosis in Charlotte, N.C. Report of Cases.**—*J. Amer. med. Ass.* **113.** 201–206. **2282**

Description of a diagnostic survey for brucellosis of persons with undiagnosed chronic illness in Charlotte, North Carolina, where most of the milk was supplied raw from herds known to be affected with infectious abortion. 325 cases of chronic illness were studied. *Br. melitensis* was isolated from three patients and *Br. abortus* and *Br. suis* each from one. Nine cases reacted serologically and a further eight were regarded as infected in spite of negative specific tests. Further particulars of three cases were published elsewhere [*V. B.* **11.** 497]. The single *Br. abortus* case was considered to have been caused by infected milk, but the origin of the other cases could not be traced.—J. E.

—. (1940). **Report of the Committee on Communicable Diseases Affecting Man. International Association of Milk Sanitarians for 1940.**—*Rep. N.Y. St. Ass. Dairy Milk Insp., 1940.* pp. 117–121. [Also appeared in *J. Milk Technol.* **4.** 223–224. (1941)]. **2283**

This takes the form of a commentary on records of health hazards from milk. (1) The report of the U.S. Public Health Service for 1938 which contained records of 42 outbreaks in 17 states, all but one of which related to unpasteurized milk or milk products, resulting in one outbreak of diphtheria, two of dysentery, six of gastro-enteritis, five of scarlet fever, six of septic sore throat, and 18 of typhoid fever. (2) A record by ROBINSON & EVANS [see preceding abst.] of human brucellosis in a community consuming raw milk, and sundry other data on this infection. (3) Speculation on the possibility that poliomyelitis can be milk-borne. (4) A note drawing attention to work on flies as vectors of bovine mastitis.—J. E.

HALLER, H. S., BABCOCK, C. J., & ELLIS, N. R. (1941). **The Effect of Pasteurization on Some Constituents and Properties of Goat's Milk.**—*Tech. Bull. U.S. Dep. Agric.* No. 800. pp. 14. **2284**

This bulletin gives details of the effect of two methods of pasteurization, the short-time, high-temperature method and the holder method, on goat's milk. The solubility of calcium and phosphorus and the denaturation of the protein fraction are so slightly affected that the difference still lies within the limits of normal for these substances. Curd tension is considerably reduced by the holder method of pasteurization, but only slightly by short-time, high-temperature pasteurization. The flavour and keeping quality are improved by these methods. The phosphatase test, used for detection of improper pasteurization, cannot be used on goat's milk, as the phosphatase enzyme is inactivated by 143°F. for 5 min. The holder method reduced the ascorbic acid content of the milk by 33–45%. The short-time, high-temperature treatment apparently did not affect the ascorbic acid.

It appears that these methods have the same effect on goat's milk as they have on cow's milk.—D. L. H.

DEANE, D. L. (1942). **Ultra Violet Radiation in Meat Storage.**—*Army vet. Bull., Wash.* **36.** 210–219. **2285**

A report of trials with Westinghouse "sterilamps" (ultra-violet light-emitting tubes) in a cold-storage room containing meat products. The lamps retarded mould formation on the food and were beneficial in keeping it in good condition and appearance.—J. E.

SÖRRENSEN, G. (1942). Fleischvergifterinfektionen. **[Meat Poisoning Infections].**—*Tierärztl. Rdsch.* **48.** 113–115. **2286**

S. relates the history of work involved in following up cases of salmonella infection diagnosed during meat inspection. The herds to which two infected animals had belonged were bacteriologically examined, by faecal culture and blood agglutination tests. One herd was found to contain three continuous excretors of "meat-poisoning" organisms and the other none (as defined in the regulations), but infection remained in the herd and later caused the death of one cow.

The article is chiefly of interest for its description of the German procedure and the quoted experiences illustrate certain difficulties in the work. The most constant P.M. finding in latently infected bovines is a gelatinous swollen spleen.—J. E.

*GAEDTKE, H. (1939). Die fleischbeschauliche Beurteilung leukosekranker Schlachtrinder. **[Meat Inspection Judgment of Bovine Leucosis].**—*Inaug. Diss., Berlin.* [Abst. from abst. in *Berl. Münch. tierärztl. Wschr.* March 28th. 161. (1941)]. **2287**

In bovine leucosis there is a general infiltration of the tissues, including muscles, with the characteristic cells. In G.'s opinion, the meat of severely affected cattle must be condemned and in doubtful cases muscle tissues should be examined histologically. Only if such examination reveals very slight changes should the meat be permitted for sale, and then only as *minderwertig*. The internal organs of affected cattle must invariably be condemned.

It is suggested that the German meat inspection law requires revision in connexion with this disease and that a still stricter standard should be made.

ATKESON, F. W., SHAW, A. O., SMITH, R. C., & BORGMANN, A. R. (1943). **Some Investigations of Fly Control in Dairy Barns.**—*J. Dairy Sci.* **26.** 219–232. **2288**

The most important factors in reducing *Musca domestica* in dairy barns in Kansas were screening of windows, systematic manure disposal, and daily spraying.

The screening of windows alone reduced the fly population by approximately 75%. In a barn in which one side was bedded and the other side kept clean, about eight times as many flies were found upon the ceilings and floors of the bedded side as compared with the clean side. The number of flies counted on floors swept and dressed each day with fresh lime was about one-third the number counted on floors which were swept only.

Spraying alone resulted in ineffective control, but when it was combined with screening, effective control was obtained even in bedded barns. The optimum amount of the various spray dilutions used was found for practical purposes to be 1 ml. to 36 cu. ft. of barn volume.

In clean, screened barns where fly control measures were in operation, the increase in fly numbers resulting from bringing in the cows was not important, but in bedded barns they increased greatly after the cattle were brought in, possibly due to the odour of the bedding.—W. M.

JIŘINA, K. (1942). Ueber die Einteilung der Rattenbekämpfungsmittel. **[Classification of Rat Poisons].**—*Berl. Münch. tierärztl. Wschr.* Oct. 30th. 324–325. **2289**

J. presents the plan of a testing scheme for rodent poisons. It includes tests for palatability as well as for lethal activity for white rats, wild rats, fowls, rabbits, dogs, and cats. A schedule in tabular form is given, intended to be filled in by the person testing the products.—J. E.

See also abstr. **2050** (TB. control in Germany), **2105-2107** (rabies control in Germany), **2310** (meat inspection in Holland), **2315** (animals as disease reservoir).

TECHNIQUE AND APPARATUS

*Faguet, M. (1941). La photoélectricité dans l'enregistrement de la croissance bactérienne. **[Photoelectricity for Measuring Bacterial Growth]**. pp. 104. Paris: Hermann. [Fr. 40]. [Abst. from review in *Bull. Inst. Pasteur.* **40.** 97]. 2290

F. has worked out a photoelectric cell apparatus which automatically records the rate of growth of bacteria in liquid media. The culture is put in a tube with parallel sides between a constant source of light and a photovoltaic cell; as growth increases in the tube, the contents become less permeable to the passage of light and these variations are recorded by an electromechanical system. Curves reproducing the rate of growth and other variations in density are obtained in this way. By means of this apparatus the study of the factors for growth and lysis by bacteriophage or other anti-bacterial substances, are greatly facilitated through the continuous recording thus obtained.—B. Weitz.

*Gengoux, P. (1942). Comparaison des méthodes à l'antiformine et àl a papaïne pour l'enrichissement et la purification des produits tuberculeux. **[Comparison of the Antiformin and Papain Methods of Isolating Tubercle Bacilli]**.—*Ann. Méd. vét.* p. 169. [Abst. from abst. in *Skand. VetTidskr.* **32.** 838 & 840]. 2291

G. obtained more positive results with Sullivan & Sears' (1918) papain method than with the antiformin method.—J. E.

Sachweh, P. (1941). Stierhodenpepton als Nährbodengrundlage. **[Ox Testicle Peptone as a Culture Medium Base]**.—*Tierärztl. Rdsch.* **47.** 82. 2292

While the value of the Hottinger extract of ox testicle as a basis for media is undoubted, it is not often used owing to the difficulty of procuring the starting material. Recently Witte have marketed a peptone prepared from such material. Directions for making the media for various purposes are briefly given. *Pasteurella aviseptica* and *Salmonella pullorum* gave surprisingly rapid yields of virulent organisms, while tubercle bacilli grown on such media with the addition of glycerol gave better results than on the more specialized and laboriously made media usually employed.

—J. G. Carr.

I. Gisske, W. (1942). Die Verwendung von Trypsin-Pepton aus Stierhoden (Witte) bei der Herstellung von Brillantgrün-Phenolrotagar. **[Use of Witte's Trypsin Peptone from Ox Testicle in the Preparation of Brilliant-Green Phenol-Red Agar]**.—*Z. Fleisch- u. Milchhyg.* **51.** 159–161. 2293

II. Röhrer, H., & Winand, H. (1942). Ueber die Eignung des Trypsin-Pepton aus Stierhoden (Witte) als Nährbodengrundlage für die Bakteriologische Fleischuntersuchung. **[Suitability of Witte's Trypsin-Peptone from Ox Testicle as Basis for Culture Medium for Bacteriological Meat Inspection]**.—*Tierärztl. Rdsch.* **48.** 301–304. 2294

I. The 1940 German order for meat inspection prescribed a bacteriological examination made upon a medium employing Liebig meat extract as a basis. This is now difficult to obtain, and substitutes have not so far proved very satisfactory. G. found Witte's ox-testicle peptone to be quite satisfactory as a basis for brilliant-green phenol-red lactose agar.

II. Witte's peptone prepared from ox testicle was found to be a suitable basis for preparing ordinary agar, brilliant-green phenol-red agar, and malachite-green phenol-red agar, when used in place of Liebig's meat extract. But it was found that the enteric group of bacteria grown on Gassner media made from this peptone more or less lost their agglutinability. The malachite-green phenol-red agar was regarded as more selective than the brilliant-green phenol-red agar.

—J. G. Carr.

Pottenger, J. E. (1942). **Counterstains in Demonstrating Mycobacterium Tuberculosis in Sputum.**—*Amer. Rev. Tuberc.* **45.** 558–567. [Spanish summary]. 2295

Counterstains were placed in the following descending order of efficiency:– 1% picric acid, 5–10 sec.; no counterstain; 1 : 15,000 methylene blue, 1 min.; 0·02% malachite green, 1 min.; 0·05% bismarck brown, 1 min.; one-third saturated malachite green, 1 min.; 1% bismarck brown, 2 min.; 0·1% methylene blue, 30 sec.; 1% methylene blue, 30 sec. The first method was about six times as efficient as the last.—E. Cotchin.

I. *Capotosti, A. (1941). La ptialo-reazione Zambrini nella specie equina. **[Zambrini's Saliva Colour Test on Horses]**.—*Nuova Vet.* **19.** 210–213. 2296

II. *Capotosti, A. (1941). La ptialo-reazione Zambrini nella specie bovina. **[Zambrini's Saliva Colour Test on Cattle]**.—*Ibid.* 183–186. 2297

[Absts. from absts. in *Jber. Vet.-Med.* **69.** 537].

I. This test of the pH of the saliva has been stated to be of value for indicating the specific "power of resistance" to infective processes. C. reports that in observations which he made on horses the test was useless.

II. C. reports that the test was valueless when used on cattle.—A. Moldawsky.

—. (1943). **Haemoglobinometry and the Use of the Haematocrit. A Report to the Traumatic Shock Committee of the Medical Research Council.**—*Brit. med. J.* Feb. 20th. 209–212. 2298

Various methods for the determination of the amount of haemoglobin in blood are criticized. These are:– (1) methods involving gas analysis, *e.g.* measurement of the oxygen capacity of blood; (2) methods whereby the colour of some haemoglobin compound is compared with a standard; (3) photometric and photoelectric methods whereby the degree of absorption by blood of light in a spectral absorption band is measured visually or by means of a photo-electric cell; (4) estimations of iron in washed red cells. The last is regarded as that which gives results which are most free from empirical factors and is therefore suitable for use as a check upon other methods. For clinical haemoglobinometry, a method of the second type is recommended whereby the colour of carboxyhaemoglobin, obtained by gassing blood with carbon monoxide, is compared with a standard. The form of Haldane-Gowers haemoglobinometer standardized by the British Standards Institution (B.S. No. 1079—1942), with scrupulous care as to the reliability and permanence of standards, is recommended. The standard of 100% for this instrument should be generally adopted to allow reliable comparison of clinical results.

The volume occupied by red or white cells is best determined by centrifuging heparinized or oxalated blood in Wintrobe's haematocrit tubes and reading off the volume from the graduated scale.—R. McAnally.

Randolph, T. G., & Gibson, E. B. (1943). **Enumeration and Differentiation of Leukocytes in the Counting Chamber with Propylene Glycol-Aqueous Stains.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 20–22. 2299

Making use of the fact that propylene glycol lyses and dissolves red blood corpuscles, the authors have devised a method for total and differential leucocyte counts in the counting chamber. The presence of propylene glycol increases the viscosity of the suspension, rendering the filling of the pipette easier; there

is less settling and clumping of the corpuscles in the pipette on standing, there is less tendency to overflow in the counting chamber, and a slower rate of evaporation. A diluting fluid made up in two stock solutions (solution I—methylene blue 0·1 g. and propylene glycol 100·0 ml.; solution II—eosin B 0·1 g. and distilled water 100·0 ml.) and mixed in equal quantities before use gave satisfactory results. This method gives accurate results and differentially stains the leucocytes, allowing both types of counts to be performed on the same preparation.—D. L. HUGHES.

ANDERSON, O. A. (1942). **Transportation of Animals Overseas.**—*Vet. Bull. U.S. Army.* **36.** 32–37. **2300**

An account of the routine work involved in transporting 264 horses and mules by steamship from San Francisco to Manila. The method of housing the animals in the ships' holds is described without diagram. —J. E.

KAHLER, H. (1942). **Apparatus for Milking Mice.**—*J. nat. Cancer Inst.* **2.** 457–458. **2301**

This electrically controlled milking apparatus, working off the institution's vacuum line, is arranged to apply suction, pulsating from one to seven or eight inches of mercury, at a frequency of 72 cycles per min., on the mammary gland. The teat cup is improvised from an ordinary serum bottle cap.

Lactating mice are separated from their young in the evening or late afternoon and milked the following morning. An average yield of milk is 0·7 ml. per milking.—ISOBEL W. BURTON.

JONES, T. C. (1942). **A Combined Autopsy Platform and Incinerator.**—*Army vet. Bull., Wash.* **36.** 275–280. **2302**

This is a description, with detailed plans and a photograph, of a combined concrete platform and trench incinerator built as a permanent structure for P.M. examinations on large animals. It is claimed to have the advantages of being simple in construction, inexpensive, and easy and hygienic in operation.

—J. A. GRIFFITHS.

SCHMIDT. (1942). Tierkörperverwertung im Rahmen einer Felddivision. **[Carcass Disposal in the Field].** —*Z. Veterinärk.* **54.** 269–273. **2303**

S. describes a simple method of producing animal meal from horse carcasses at the eastern front of the German armies, a simple apparatus being used which was constructed from available materials, *viz*, a boiler, a drier, and a hand mill.

The meal was fed as a protein supplement to army horses in daily amounts up to about 400 g.—J. E.

PACKCHANIAN, A. (1943). **An Animal Board for Rabbits, Monkeys, and other Laboratory Animals.**—*J. Bact.* **45.** 167–176. **2304**

A new type of board for securing laboratory animals is described. It is adjustable for operations on monkeys, rabbits or g. pigs by means of a movable neck piece. The animals can be secured single-handed on the board in numerous positions and it is suitable for observation for several hours without constant supervision. Details of the construction and methods of use of the board are given.—B. WEITZ.

LEWIS, K. M., BREIDENBACH, L., & STADER, O. (1942). **The Stader Reduction Splint for treating Fractures of the Shafts of the Long Bones.**—*Ann. Surg.* **116.** 623–636. **2305**

This splint consists essentially of two pin bars which are joined by an extension bar. Each pin bar is drilled to carry two stainless steel pins which are inclined at an angle to each other; it is this inclination which gives them a firm grip on the bone. The pins are inserted through skin and muscle and transfix the bone. With careful aseptic precautions, one pin bar is attached to the upper and one to the lower fragment of the bone and they are then joined by the extension bar. The pin bars and extension bar are, of course, completely external in position, only the pins penetrating the flesh. By adjusting the length of the extension bar and the position of the pin bar relative to it, fractured bones can be accurately aligned; the pin bar and extension bar are then locked in position, immobilizing the fracture.

This splint was first devised by a veterinarian (STADER) who was dissatisfied with the usual methods of treating fractured limbs. Since 1931, it has been used on over 1,200 fractures in dogs and the results have been far superior to those obtained by the older methods of treatment; there is a photograph of the splint in position on the femur of a spaniel. The splint is now being tried in human surgery with very good results. It is believed that its simplicity and the very rapid restoration of function following its application will render it particularly valuable in war surgery. It is also stated [see *Science News Letter*. Nov. 14th, 1942] that the splint has been used with success on a horse.

—JOHN FRANCIS.

See also absts. **2043** (cultivation of streptococci), **2173** (of agent of fowl leucosis), **2063** (standardization of P.P.D.), **2052** (diagnosis of TB.), **2079** (of blackleg), **2082** (of gas gangrene), **2317** (chemical solutions), **2318** (statistics).

MISCELLANEOUS

RUSSELL, J. (1943). **Restarting Agriculture in Devastated Europe.**—*Nature, Lond.* **151.** 433–438. **2306**

In the now "occupied countries" of Europe there were before the war 44 million cattle, 34 million sheep, 10 million goats, 27 million pigs, and 10 million horses; the total human population was 137 million. By the middle of 1942, the estimated losses included 11 million cattle, with a 35% drop in the total milk yield, 11 million sheep, 12 million pigs, 3–4 million horses and about three-quarters of the total poultry population. Restocking will be a difficult process, and the mistake made after the war of 1914–18, *viz*, that of sending animals before the food is ready for them, must not be repeated.

It seems probable that re-establishment of the herds of "milking cattle" must come mainly from natural increases, but this can be aided by the setting-up of artificial insemination centres, first-class bulls being used. Some six years may elapse before the cattle population is restored, and during this time dried milk and other dairy produce will have to be imported.

Restoration of the horse population may take 15–16 years. Sheep present a less difficult problem, but it is estimated that in areas such as south-eastern Europe, nine years may be necessary for restoration.

The pig and poultry problems are complicated by the fact that these species require such foodstuffs as grain, potatoes, skim-milk, fish, and meat which are also needed for human consumption. Actual restoration of numbers in each case is not difficult, but will be delayed by human needs. Even so, both species must be supplied to peasants.

The reduction in livestock population has greatly decreased the production of farmyard manure.

—ALASTAIR N. WORDEN.

—. (1942). **Radical Changes in the USDA "for the**

Duration ".—*J. Amer. vet. med. Ass.* **101.** 166. [Copied *verbatim*]. 2307

Under executive order issued by President Roosevelt in February, 1942, the following mergers within the Department of Agriculture will be in force until six months after the war ends.

(1) The Surplus Marketing Administration, including the Federal Surplus Commodities Corp., the Agricultural Marketing Service (except the agricultural statistics division), and the Commodity Exchange Administration are merged into an agency to be called the Agricultural Marketing Administration.

(2) The agricultural statistics division of the Agricultural Marketing Service is transferred to the Bureau of Agricultural Economics.

(3) The Agricultural Adjustment Administration, the Soil Conservation Service, the Federal Crop Insurance Corp., and the sugar division are brought together into an agency to be known as the Agricultural Conservation and Adjustment Administration.

(4) The bureau of animal industry, the bureau of dairy industry, the bureau of plant industry, the bureau of agricultural chemistry and engineering, the bureau of entomology and plant quarantine, the bureau of home economics, the office of experiment stations and the Beltsville researeh center, are consolidated into the Agricultural Research Administration.

(5) All Department of Agriculture libraries are consolidated into one.

WELSH, M. (1943). **Modern War and Farm-Animal Diseases.**—*J. Amer. vet. med. Ass.* **102.** 1–6. 2308

Discussing the need for maximum food production in wartime and the veterinarian's role in keeping livestock healthy, W. suggests ways of improving the Nation's veterinary service. He states the need for diagnostic laboratories provided by governments for the use of veterinary practitioners, the keeping by practitioners of statistical records of disease distribution, and the control of the sale of livestock remedies and biological products. He considers that the measures he advocates would enable the incidence of animal disease to be lowered and that the war effort would consequently be strengthened.—J. A. GRIFFITHS.

*KILLMER. (1942). Die Organisation des Veterinärwesens im Protektorat Böhmen und Mähren. **[Veterinary Organization in Bohemia and Moravia].**—*Dtsch. Tierärztebl.* **9.** 7–8. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 517]. 2309

Although the Protectorate is autonomous and the veterinary administration and legislation is in the control of the local veterinary officers, the Reich has its own administration and this consists of ten German superintending veterinary officers attached to the office of the German governor. Among 1,000 local veterinarians, 243 are in the State service. The Czech veterinary service is said to be poorly organized for rapid action in the event of epizootics. The Germans are said to have improved meat-inspection services, in which most of the district veterinarians are engaged. There is a veterinary research institute in Ivanovice which produces sera and vaccines.—A. MOLDAWSKY.

*DEMMEL, M. (1941). Die "Opzichter", in den Niederlanden—staatliche Laienhelfer in der Veterinärpolizei. **[Overseers in Holland—State Lay Assistants in Veterinary Police Work].**—*Dtsch. Tierärztebl.* **8.** 176–177. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 518]. 2310

This personnel is recruited from lay meat inspectors who must also be qualified butchers. After two months' training under veterinary supervision they are incorporated as *opzichter* [overseers]. They assist veterinary inspectors or their deputies, and act on their behalf under their authority. According to Dutch opinion, these lay assistants have proved to be efficient for the past 40 years. D. criticizes the employment of lay assistants, stating that this may be justified only either by lack of qualified veterinarians or during a period of emergency.—A. MOLDAWSKY.

*DE DOMINICIS, L. (1941). Die tierärztliche Berufstätigkeit in Italien. **[Veterinary Affairs in Italy].**—*Dtsch. Schlachthztg.* **41.** 338–340. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 528]. 2311

There were in Italy, including the Empire, about 4,500 veterinarians, 500 of whom were in the State service, 3,000 in public health services, and the remainder in private practice, research, etc. There are ten veterinary faculties—in Turin, Milan, Parma, Bologna, Pisa, Perugia, Naples, Messina, Sassari, and Camerino which confer approximately 170 doctorates each year. There are also 11 research stations and three more are planned. The need is emphasized for a research station in each province. Recently, veterinarians have been engaged in the purchase of livestock and the distribution and control of meat for the military and civil population.—A. MOLDAWSKY.

WEGNER, E. E., & HAZLET, S. E. (1943). **Physiological Chemistry in the Veterinary Colleges in the United States. 1941-1942.**—*J. Amer. vet. med. Ass.* **102.** 16–18. 2312

A tabular comparison of the courses of instruction at the ten colleges.—J. E.

STAPLES, R. R., HORNBY, H. E., & HORNBY, R. M. (1942). **A Study of the Comparative Effects of Goats and Cattle on a Mixed Grass-Bush Pasture.**—*E. Afr. agric. J.* **8.** 62–70. 2313

Five comparable plots, all recently planted with *Cynodon* grass, were employed, two being grazed by goats, two by zebu oxen, and one left ungrazed. Groups of two oxen or 14 goats were used, these being considered to have approximately equal food intakes, and the total amount of grazing allowed to each group was identical. At the end of four years of heavy grazing, the cattle plots had become open thicket with poor grazing, bare ground that invited erosion and cover sufficient for the needs of tsetse flies. The plots grazed by goats, however, were still grassland capable of providing grazing for any class of stock and unsuitable for tsetse.

Investigations are now planned to ascertain whether or not goats may with advantage be introduced into "chess board" schemes of rotational grazing originally designed for cattle.—ALASTAIR N. WORDEN.

REPORT

EIRE. (1942). **Eleventh Annual Report of the Minister for Agriculture 1941-42.** pp. 168+[78]. Items of veterinary interest pp. 40–46, 75–76, 121–130, [6]–[8], [31]–[32], [50] & [54]–[58]. Dublin: Stat. Off. [8vo] [3s. 6d.] 2314

VETERINARY COLLEGE OF IRELAND.—There were 312 students during the 1941–42 session and 33 passed the final examination. Particulars are given on the work of the various departments, including much diagnostic work.

VETERINARY RESEARCH LABORATORY.—Figures are given on diagnostic work done and on biological products issued. Research was limited to a small-scale vaccination experiment on bovine brucellosis.

DISEASES OF ANIMALS ACT, 1894–1938.—An outbreak of FOOT AND MOUTH DISEASE in the previous year which lasted until September, 1941, required the services of many of the staff during the year. The history of the epizootic and its control are described. In all 6,253 farm animals became affected and 43,347 were slaughtered in the stamping-out policy at a compensation cost of £450,644, of which about £40,000 was recovered from the sale of salvaged carcasses. 1,271 cattle were slaughtered on account of TUBERCULOSIS. There were 136 outbreaks of SHEEP SCAB.

AGRICULTURAL DEPARTMENT, UNIVERSITY COLLEGE, DUBLIN.—Work was carried out on animal nutrition and this report contains records of research on the nutrition of cattle, the vitamin A and D requirements of pigs, seaweed as food for pigs, a nephritic disorder of chickens (evidently due to excess of meat meal), and other dietary conditions of fowls.

Appendixes to the report contain tabular data on tests for PULLORUM DISEASE (1·96% reactors in 103,917 samples), cases treated in the veterinary dispensary scheme, and statistics and expenses of operating the Diseases of Animals Act.—J. E.

See also absts. **2105-2107** (rabies control in Germany).

BOOK REVIEWS

WHITE, J. G. (1941). **The Animal Kingdom a Reservoir of Disease.** pp. 64. Madison College, Tenn.: Julius Gilbert White Publications. [8vo] [50 cents]. **2315**

This is one of a number of published booklets on public health, intended for adult education. In an attempt to achieve accuracy, it is composed almost entirely of paragraphs from papers written by quite good authorities, and references are given. The result, however, is decidedly unhappy and on numerous points the book is a glaring example of truths distorted by unsuitable quotation: thus an uninformed reader might suppose that foot and mouth disease has a high mortality (30–50%).

The author appears also to try to magnify the main theme and includes many diseases which are not transmitted by animals to man, *e.g.* cancer, or do not infect man at all, *e.g.* Johne's disease and pullorum disease.

The author's method of fact finding and presentation has therefore to be condemned. A layman reading this book would be seriously misled.—J. E.

—. (1942). **The Biological Action of the Vitamins. A Symposium.** [Edited by] EVANS, E. A., Jr. [Associate Professor of Biochemistry, The University of Chicago]. pp. ix+227. Numerous figs. Chicago, Ill.: The University of Chicago Press. [8vo] [19s.] **2316**

The papers presented at this symposium held at Chicago in September 1941 cover an interesting field of advanced knowledge about the function of vitamins within the organism. A general introduction by C. A. ELVEHJEM is followed by reviews on cocarboxylase, clinical aspects of vitamin B_1, riboflavin, pellagra and nicotinic acid, pyridoxine, pantothenic acid and the microbiological approach to the study of vitamins, biotin, choline, the economy of phosphorus in the animal organism, and vitamin K. Recent important clinical developments in the knowledge of the role of riboflavin, pantothenic acid, and vitamin K occupy sections apart from those concerned with the experimental studies. The whole volume is well edited and easy to read. It makes a welcome addition to the vitamin bookshelf with a particularly useful collection of information about the B vitamins.—A. M. COPPING.

WELCHER, F. [Assistant Professor of Chemistry, Indiana University]. (1942). **Chemical Solutions. Reagents Useful to the Chemist, Biologist, and Bacteriologist.** pp. vii+404. New York: D. van Nostrand Company, Inc. [8vo] [$ 4·75]. **2317**

This useful compilation of the formulae of those solutions most frequently used in routine experimental work in laboratories devoted to organic chemistry, biochemistry, metallurgy, food chemistry, bacteriology, gas and fuel analysis, water analysis etc., has been selected from the literature covering all phases of chemical laboratory work. The reagents described include indicators, standard acids and bases, solutions of salts, special test reagents, stains, fixatives, and culture media. In addition to methods of preparation the text includes notes on (a) the uses, and procedure for use, of each solution, (b) a list of those substances which interfere with the reaction in special tests, (c) the sensitivity of test reagents, and (d) remarks on keeping qualities and methods of storage of the various reagents. In addition, one or more references are included for each solution in all cases where a useful citation is available.

The solutions are listed in alphabetical order under the name by which they are most commonly known, cross-references being given where different names are in common use. An index of the reagents, classified according to their uses, is provided.—J. L. MCGIRR.

MATHER, K. [D.Sc., Ph.D., Head of the Genetics Department, John Innes Horticultural Institution, London]. (1943). **Statistical Analysis in Biology.** pp. 247. 9 figs. London: Methuen & Co., Ltd. [8vo] [16s.] **2318**

This book aims at presenting in simple terms the basic theory of modern biological statistics and of providing the means of understanding the special uses of the available techniques, thus enabling the investigator to decide on the methods most suitable for particular requirements. It is written by a biologist for biologists and emphasizes throughout the necessity of relating statistical analysis to the problem under investigation. It shows how experiments can be planned to give the maximum return of information for the labour expended.

The introductory chapter deals with the nature of statistics, populations and samples, diagrams and graphs. Subsequent chapters deal with "Probability and Significance"; "Distributions"; "Tests of Significance"; "The Significance of Single Observations, Sums, Differences and Means"; "Degree of Freedom and the Analysis of Variance". In the chapter on "Planning Experiments", the use of factorial design is discussed and applications of the principles are illustrated by a number of actual experiments. Other chapters deal with the "Interrelations of Two Variables"; "Polynomial and Multiple Regressions"; "Correlation", and "The Analysis of Frequency Data". The final chapter on "Estimation and Information" deals with probability and likelihood.

A good index and a useful glossary of terms are given. Tables of "C", "t", χ^2, and of "variance ratio" are appended.

A foreword by Professor R. A. FISHER is sufficient guarantee of the statistical soundness of the text.—R. A.

See also absts. **2266** (toxicology of insecticides). **2290** (photo-electric measurement of bacterial growth).

3691—Wt.P.12—Dd.187—750—9/43—H. R. G. Ltd.—G13

Printed under the authority of His Majesty's Stationery Office by H. R. GRUBB, LTD., Croydon

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

The latest list of the publications indexed for this purpose was included in *Index Veterinarius*, Vol. 6, No. 1 (issued December, 1938) and also circulated with the *Veterinary Bulletin*, Vol. 9, No. 1.

About 10,000 references are indexed each year, each reference being suitably cross-indexed alphabetically under subjects and under names of authors.

As each half-yearly issue consists of a single complete alphabetical index of subjects and authors' names, a search through it involves a minimum of trouble, and all information required is readily found.

Each number contains the indexing done by the Bureau during the previous half-year, *i.e.*, No. 1, issued in December, covers the indexing done during the previous January to June.

The dates of issue of the two numbers of each volume are as follows :—

No. 1.—Issued December. Indexing period previous January—June.
No. 2.—Issued June. Indexing period previous July—December.

Vols. 1 to 3 (1933, 1934 and 1935) of the Index were produced on a duplicator; from Vol. 4 onwards it has been printed.

Vols. 1 to 5 were issued in quarterly parts; the issue is now half-yearly.

Annual Subscription, £5.

A limited number of copies printed on one side only are available for those who wish to mount references on cards.

Orders may be sent to :—

CENTRAL SALES BRANCH,
(IMPERIAL AGRICULTURAL BUREAUX),
AGRICULTURAL RESEARCH BUILDING,
PENGLAIS,
ABERYSTWYTH,
WALES.

Imperial Bureau of Dairy Science

Shinfield, Reading, England

DAIRY SCIENCE ABSTRACTS

A comprehensive collection of abstracts of current literature dealing with milk and dairy products: husbandry, technology, control and standards, economics, physiology, bacteriology and mycology, chemistry and physics. Published quarterly. Subscription 25s. per volume of 4 numbers (5s. discount to British subjects who subscribe direct): single copies, 7s. 6d.

Technical Communications

No. 1. The phosphatase test for control of efficiency of pasteurisation. H. D. Kay, R. Aschaffenburg and F. K. Neave. Price 2s. (postage 2d. extra).

Imperial Bureau of Animal Nutrition

Rowett Institute, Aberdeen, Scotland

NUTRITION ABSTRACTS AND REVIEWS

Consists of abstracts of papers published throughout the world dealing with the subject of nutrition in all its aspects. They are arranged under the following sections: technique (including chemical and experimental methods), composition of food, physiology of nutrition, human diet in relation to health and disease (including dietary studies, food economics, deficiency diseases and therapeutic dietetics), feeding of animals and book reviews. Each issue also contains a review article on some subject of general interest.

Published quarterly. Annual subscription 42s.

Technical Communications

These are published at irregular intervals; lists and prices on application.

Imperial Bureau of Animal Breeding and Genetics

King's Buildings, University of Edinburgh

ANIMAL BREEDING ABSTRACTS

This journal contains abstracts and reviews of current publications bearing on animal breeding, genetics, production, sex physiology, reproduction and cognate subjects. Published quarterly. Subscription rate, 25s. per annum.

Occasional Communications and *Bibliographies* are also issued from time to time.

Imperial Bureau of Pastures and Forage Crops

Agricultural Research Building, Penglais, Aberystwyth

This Bureau covers current literature on grassland, forage crops and plant biological research, and issues two quarterly publications:—

HERBAGE ABSTRACTS and HERBAGE REVIEWS

The latter publication contains original articles and reviews on topics which merit more detailed consideration than can be given in the former.

Subscription rates: *HERBAGE ABSTRACTS.* 25s. per annum (single parts, 7s.).
HERBAGE REVIEWS. 15s.* per annum (single parts, 4s.).

*A reduction of 5s. will be made when *HERBAGE ABSTRACTS* is also ordered.

At irregular intervals larger monographs are published on miscellaneous subjects in the form of *Bulletins*.

All correspondence regarding subscriptions to journals and sales of occasional publications should henceforth be addressed to: Central Sales Branch (Imperial Agricultural Bureaux), Agricultural Research Building, Penglais, Aberystwyth.

Printed in Great Britain by H. R. Grubb, Ltd., Poplar Walk, West Croydon